AN ASSESSMENT OF ETHNIC DIFFERENCES IN DRUG USE DECISION
MAKING AMONG AFRICAN AMERICAN AND WHITE AMERICAN HYPERTENSIVE
PATIENTS: IMPLICATIONS FOR HYPERTENSION MANAGEMENT

By

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A DISSERTATION PRESENTED TO THE GRADUATE SCHOOL
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This manuscript is dedicated to my parents, Herbert and Beverly Brown, who have provided me with unyielding support over the years. My mother served as an exemplar of strength under the toughest circumstances. My father has always backed me in my educational decisions even when he had no idea how they were to be financed. I thank my two brothers, Jerome and Dexter, for serving as my connections to reality outside of graduate school and always keeping me in check. I would like to thank my grandmothers, aunts, uncles and cousins for their support as well as their acceptance of my collect calls. Finally, thanks go out to all of my wonderful friends and to my colleagues at Xavier University of Louisiana for their unwavering support and confidence in me.

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The purpose of this study was to explain and to predict
drug use behavior among African American and White American
hypertensive patients within the context of health
perceptions and their subsequent effect on drug use
practices. Using the Health Belief Model (HBM) as the
theoretical framework, this study examined both the
associations of cultural variables (ethnicity and
hypertension temporal orientation) with health perceptions
and the effects of these culturally-related health
perceptions on compliance with prescription medication (Rx)
and use of home remedies (HR). Data were collected via
telephone interviews with 300 individuals who had been
medically diagnosed as having hypertension and who had not
experienced any major complications of uncontrolled
hypertension.

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The study's findings revealed that, after controlling for selected covariates, African Americans perceived that the costs of Rx were more burdensome compared to White Americans. Ethnic group differences, however, were more apparent when the health perceptions were evaluated within the cultural context of hypertension temporal orientation.

Factor analysis results indicated that hypertension temporal orientation can be categorized into three groups: (1) nonexperiential domain which represented potential consequences of hypertension; (2) experiential disease domain which involved the day-to-day dealing with hypertension; and (3) experiential treatment domain which involved the daily management of hypertension. African Americans were more present oriented than White Americans concerning their daily management of hypertension. A more future orientation regarding hypertension management was associated with higher perceptions of severity, susceptibility, benefits of Rx, and costs of HR and with lower perceptions of costs of Rx and benefits of HR. Significant predictors of compliance with Rx were age, costs of Rx and benefits of HR. Severity, benefits and costs of HR, ethnicity, and a poverty by education interaction significantly explained use of HR.

The results of this study supported a number of principal conclusions: (1) cultural variables influence individual perceptions of disease and evaluations of

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treatment alternatives; (2) compliance with Rx is affected
by demographic characteristics and by beliefs about costs of
Rx and benefits of HR; and (3) use of HR is a function of
demographic characteristics, perceptions of disease
severity, and evaluations of benefits and costs of HR.

The Need for the Study

Problem of Hypertension

An estimated 60 million persons in the United States
have hypertension. Of these, only about 32 million are
aware of having this disease (The American Heart
Association, 1990). The findings of a study conducted by
the South Carolina Department of Health in 1987 revealed
that 28% of persons with hypertension were unaware of their
hypertension, 12% were aware but not treated, 28% were being
treated but not controlled, and 32% were being treated and
controlled (Gorlin, 1991). Clark (1991) also cited evidence
indicating that more than half of the hypertensives are
either untreated or inadequately controlled. Similarly,
findings from a national report indicated that of the
estimated 60 million hypertensives, possibly one-third are
receiving medical treatment, and only six million are
appropriately managed (The American Heart Association,
1990). Thus, it is reasonable to conclude that somewhere
between 10% to 32% of all people with hypertension are
adequately controlled.

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Hypertension has been an enduring problem in the African American community. Blacks have both a higher prevalence of hypertension and a higher age-specific mean blood pressure than that of whites (Klag et al., 1991). Most studies indicate that statistically significant blood pressure differences between the races occur sometime after age 17 (Hildreth and Saunders, 1991). The frequency with which hypertension occurs in the African American community ranks as one of the highest in the world. The prevalence of Stage I (mild) and Stage II (moderate) hypertension is more that twice as high in black adults as in white adults, and the incidence of Stage III (severe) hypertension is five to seven times higher in blacks than in whites (Hildreth and Saunders, 1991). Moreover, since blacks develop more severe hypertension earlier and remain untreated or uncontrolled for longer periods of time, more severe consequences of longstanding hypertension result (Kannel, 1974). Millions of African-Americans die each year as a result of strokes, heart attacks, and other cardiovascular-related illnesses that are directly linked to uncontrolled hypertension. Among hypertensives in the United States, blacks are 10 to 18 times more likely to experience kidney failure, and three to five times more likely to develop chronic heart failure than whites (Fackelmann, 1991).

Although the treatment of hypertension has generally improved over the last two decades, the rate of improvement

among African Americans is slower compared to that of White Americans (Hildreth and Saunders, 1991). The reasons for this discrepancy are generally unclear. Nevertheless, among those diseases that plague the black community, hypertension ("the silent killer") ranks as one of the most prevalent.

Compliance with Treatment Regimens

As described earlier, more than half of all the people with hypertension are either untreated or treated without sufficient blood pressure control. One of the major reasons cited for inadequate control of high blood pressure is the failure to adhere to treatment regimens (Gorlin, 1991). In general, noncompliance rates for many medications have been found to be in the 25% to 50% range (Fletcher, 1989).

Based upon a review of literature before 1984, Christensen (1985) cited a number of factors that have been found to be associated with compliance. These factors include the perceived seriousness of the disease, the perceived efficacy of the treatment, the complexity of the prescribed regimen, the duration of therapy, adverse effects of the prescribed regimen, the amount of medical supervision the patient receives, and patient satisfaction with the physician visit. An additional factor, not included in his review, is locus of control which has also been found to be related to compliance (Rotter, 1954; Balsmeyer, 1984). Some evidence suggests that sociodemographic variables (e.g.,

socioeconomic status and race) are related to compliance (Kirscht and Rosenstock, 1977; Nelson et al., 1978). However, a later review of compliance literature failed to provide any evidence indicating that general compliance rates remarkably differed across sociodemographic groups (Fletcher, 1989).

Noncompliance rates among hypertensive patients vary greatly, with an approximate range of 30% to 70% (Sackett and Snow, 1979; Clark, 1991). For example, Klein (1988) found that approximately 60% of hypertensive patients took their medications as prescribed. In a national survey of patients who stopped taking their antihypertensive medications, approximately half (46%) reported that they stopped because they thought that they were cured, and 25% indicated they stopped because they thought their doctor had told them tc stop (Gallup and Cutugno, 1986). Surprisingly, only 11% of them reported stopping because of side effects and 6% stopped because they could not pay for the medication. These findings are especially important since they highlight the role of patient perceptions of illness in drug use decisions, as evidenced in the nearly 70% who stopped taking their medications because of subjective reasons rather than because of drug-related or financial reasons.

Hypertension and its management provide an interesting topic of study for three reasons: (1) hypertension has both

folk-based and scientifically-based interpretations among various groups; (2) hypertension is an asymptomatic condition; and (3) the value of managing hypertension is based upon reducing the probability of future negative consequences. In the first case, patients with folk-based interpretations of high blood pressure may be more inclined to use alternative treatments than those who hold scientific views. In the second case, the asymptomaticity of hypertension is generally problematic in all patients in that they find it difficult to engage in illness behavior (e.g., taking medication) when they do not feel ill. Moreover, in the short run, many prescribed antihypertensive regimens make patients feel worse than when the condition goes untreated. In the third case, because the management of hypertension is based on future events, patients must be motivated to take their medications such that the future benefits of therapy are recognized. Essentially, adherence to prescribed treatment regimens poses a special medical care dilemma; all three factors just mentioned figure into patients' decisions about and evaluations of treatment options.

Culture, Health Beliefs, and Health Behaviors

Of the many factors shaping health beliefs and behaviors, culture, as indicated by ethnicity, has been shown to be of particular relevance (Harwood, 1981). This

assertion was supported by a review of sociological,
anthropological, and psychological health-related research
conducted by Landrine and Klonoff (1992) showing that health
beliefs of White Americans and of ethnic-minorities in this
country are culturally shaped and organized. Accordingly,
the health beliefs of White Americans differ substantially
from those of African-Americans, and there also is
considerable variation in health beliefs within each of
these groups (Landrine and Klonoff, 1992; Harwood, 1981).

Through life experiences, members of an ethnic group
often acquire certain perceptions and beliefs about health
and illness that are consistent with the customs and values
of their particular culture. Moreover, these culturally-
relevant health beliefs and perceptions guide individuals'
health actions and behaviors. Health beliefs and behavior
encompass a wide variety of knowledge and activities ranging
from estimates of the seriousness of various illnesses and
one's susceptibility to them to adherence to drug therapy
regimens (Becker and Maiman, 1975). An inherent assumption
behind the concept of "compliance" is that the patient has
no prior beliefs and attitudes about illness that may affect
whether or not medical regimens are carried out. Clearly,
if the indicated treatment is not congruent with the
patient's model of illness, then it is likely that the
patient will not "comply." Insight as to how ethnicity, as
manifested in culture, influences health beliefs and

perceptions would prove fruitful in advancing our understanding of drug use decision making.

Problem Statement

As indicated by the preceding discussion, patient compliance has been an enduring problem in medical care, especially among patients with chronic diseases (e.g., hypertension). In the area of hypertension, adherence to therapy has been found to be lower in black patients than in white patients, especially in black males (Gorlin, 1991). There is an abundance of literature that examines patient compliance with treatment regimens with particular emphasis on the identification of factors associated with compliance behavior. Although these factors have been crucial to our ability to predict compliance behavior (Ried and Christensen, 1988), a much deeper understanding is needed of the decision process of patients within the context of health and illness perceptions and its subsequent effect on health and medical care practices.

A major problem in compliance research is its failure to acknowledge the multidimensionality of drug use. Failure to "comply" with prescribed medical regimens does not mean that the patient goes untreated. Despite the evidence that culture has been shown to influence the beliefs and perceptions of members of different ethnic groups, little is known about possible ethnic differences in the decision-

making associated with drug use behavior. Moreover, it is
not clear how these differential illness and treatment
perceptions are related to the use of formal and informal
treatment alternatives. No research has explicitly assessed
ethnic differences in drug use decision making. It is
essential that we evaluate and integrate these cultural and
ethnic differences into treatment plans so that treatment
programs can have increased potential for success.

Purpose and Significance

The overall goal of this project is to assess drug use
behavior among African American and White American
hypertensive patients. Specifically, this project seeks to
examine the relationships among ethnicity, poverty status,
temporal orientation, and health perceptions and their
individual and combined relationships with drug use
behavior. The specific variables of interest are based upon
the six dimensions of the Health Belief Model (HBM) and will
be discussed in a succeeding section.

Since hypertension affects such a large proportion of
the United States population, especially in the African
American community, it is very important to determine how
ethnic and cultural influences are related to health beliefs
and perceptions that ultimately guide both formal and
informal drug use practices. In addition, a study is needed
to assess this aspect of drug use which is, for the most

part, unexamined in the literature. This understanding will hopefully enable health care practitioners to facilitate more appropriate drug use among hypertensive patients. Moreover, health care providers would be better equipped to plan strategies for the management of hypertension that have increased potential for effectiveness and that are culturally-relevant to members of both the African American and White American populations.

Research Questions

In meeting the goals of this project, the following research questions will be addressed:

1) What is the relationship of ethnicity, poverty status, and temporal orientation to health perceptions of hypertensive patients?

2) What is the relationship of these factors individually with drug use behavior?

3) What is the relationship between health perceptions and hypertensive patients' drug use behavior?

4) Do the two ethnic groups significantly differ with respect to drug use behavior? Is this difference accounted for by intergroup differences in poverty status, temporal orientation and health perceptions?

5)   Does the conceptual model adequately explain drug
     use behavior among African American and White
     American hypertensives?

CHAPTER 2
REVIEW OF LITERATURE

This literature review is divided into two sections:
(1) drug use behavior research, and (2) temporal orientation
research.

Drug Use Behavior Research

Patient drug use behaviors have been the focus of much
research over the years. Most studies investigating drug
usage have been referred to as compliance research. As
implied by the term "compliance," many of these studies have
suggested that patients are at blame for not following the
prescribers' drug orders. In recent years, however,
compliance research has moved away from placing blame on the
patient, acknowledging the patient as an active participant
in drug use decisions. In essence, what is seen as
noncompliance from a practitioner's standpoint may be deemed
as "rational decision making" by the patient (Donovan and
Blake, 1992). Due to the confusion and negative connotation
associated with the term "compliance," the term "drug use
behavior" is used in this research effort. Nevertheless, in
remaining consistent with the most customary term in the

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literature, compliance is used in selected parts of this
chapter.

Overview of Compliance with Medication Regimens

In their reviews of empirical studies of patient
compliance, Christensen (1985) and Fletcher (1989)
determined that noncompliance with medication regimens is
between 25% and 50%. Noncompliance rates are even higher
among patients with chronic diseases, such as hypertension,
requiring long-term or lifetime medication therapy. On
average, a little more than 50% of hypertensive patients
take their medication as prescribed (Sackett and Snow,
1979), although compliance rates as low as 35% to 40% have
been found among hypertensives (Dirks and Kinsman, 1982;
Sackett and Snow, 1979). For example, Nelson and his
colleagues (1978) found that of the 121 patients being
treated for hypertension in their study, almost 60% of the
patients had missed one or more doses during the 28 days
prior to the data collection.

Factors Associated with Compliance

Patient compliance studies have been reviewed by
Haynes, Taylor, and Sackett (1979), DiMatteo and DiNicola
(1982), Christensen (1985), and later by Fletcher (1989).
In these reviews, the authors identified many factors
associated with compliance behavior. These factors can be

grouped into three categories: (1) psychological factors, (2) socio-environmental factors, and (3) patient-provider relationship factors.

Psychological factors. Many researchers and practitioners have postulated that a person's beliefs and attitudes predispose them to either compliant or noncompliant behaviors. As a result, investigators have employed a number of psychologically-based approaches to explain drug use behavior among patients. Some evidence indicates that noncompliance can be the result of deliberate attempts by patients to exert control over their illness (Conrad, 1985). Similarly, researchers have found that the health locus of control of individuals is associated with compliance behavior (Johnson and Beardsley, 1978; Schlenk and Hart, 1984). Other research indicates compliant behavior is related to the individual's belief about the threat of the disease or its sequelae and the perceived benefits versus costs of treatment (Ried and Christensen, 1988; Nelson et al., 1978; Becker and Maiman, 1975). Still other researchers have found that lay beliefs, particularly when inconsistent with western medical thought, will lead to noncompliant behavior (Donovan, Blake and Fleming, 1989).

Socio-environmental factors. A second approach to understanding compliance involves the social and environmental influences in peoples' everyday lives. This perspective recognizes that drug use does not occur in a

vacuum, but that it is one of a myriad of influences in one's daily life. The process of carrying out medication regimens requires thought, time, money and other resources that impact patient behaviors (DiMatteo and DiNicola, 1982). Graveley and Oseasohn (1991) found that the complexity of the regimen, the duration of treatment, adverse effects of the regimen, and financial costs of therapy are all related to compliance behavior. Other research indicated that social support is also instrumental in managing chronic illness (e.g., hypertension) (Strogatz and James, 1986; Schlenk and Hart, 1984). Yet other studies have indicated the importance of social influences (e.g., friends and family) and culture in predicting medication taking behaviors (Ried and Christensen, 1988; Becker and Maiman, 1980).

Provider-patient relationship factors. The third approach to studying compliance is concerned with the interaction of the patient and the health care provider. Numerous studies have suggested that the quality of the physician-patient encounter was partly responsible for noncompliance. For example, patients' dissatisfaction with their visits to physicians, physicians' failure to effectively communicate drug- and disease-related information, and lack of care or genuine concern on the part of the provider (Garrity, 1981; Christensen, 1985; Kaplan et al., 1989) have all been found to be associated with

patients' resistance to following medication regimens.
Garrity (1981) found that noncompliance can be partially
explained by the amount of medical supervision a patient
receives once drug therapy has been initiated.

The large number of factors associated with compliance
behavior is a clear indication of the complexity of drug use
practices. However, DiMatteo and DiNicola (1982) argued
that there is value in this diversity in that " . . . it
helps to counteract the tendency of medical professionals to
conceptualize noncompliance as a unitary phenomenon . . . "
(p. 19). Since the decision to comply with medical regimens
ultimately lies with the patient within the context of
her/his beliefs and values, drug use behavior is necessarily
" . . . embedded in an intricate web of social and
psychological factors" (DiMatteo and DiNicola, 1982, p. 19).
Peoples' beliefs about and evaluations of health and medical
care practices affect their choices among alternative
actions. Accordingly, most models of health behavior and
subsequent studies of patient drug use practices have
generally included patient beliefs and perceptions as a key
element in health and medical care research (Cummings,
Becker, and Maile, 1980).

Health Beliefs and Health Behaviors

Health belief model

One of the most commonly cited models of health
research is the Health Belief Model (HBM). The HBM was

originally developed to explain preventive health behavior
(Rosenstock, 1966). However, it has since been broadened to
explain compliance with health recommendations and
medication regimens (Becker and Maiman, 1975). The central
tenet of the HBM is its focus on subjective beliefs in the
context of individual behavior. The HBM is rooted in the
value expectancy tradition and thus serves as a framework to
explain patients' motivations to engage in health behaviors
(Becker, 1974). A key assumption of the HBM is that
motivation is a necessary prerequisite for action and that
individual perceptions are selectively governed by motives
(Becker, 1974).

There are six primary elements of the HBM which include
(1) perceived susceptibility to the disease or its sequelae,
(2) perceived seriousness of the disease, (3) perceived
benefits of treatment alternatives, (4) perceived barriers
to (or costs of) treatment alternatives, (5) cues to action,
and (6) modifying factors. In the context of individual
health behavior, the HBM posits that the probability that an
individual will engage in a recommended health action
depends upon: (1) one's perception of the threat of the
disease, which is determined by the perceived seriousness of
the disease and the perceived susceptibility to the disease
or its consequences; (2) one's weighing of the perceived
benefits of action as compared to the perceived barriers to
action; and (3) cues to action to "trigger" the appropriate

response. These cues could be internal (e.g., symptoms) or external (e.g., mass media campaigns). The "motivating force" that results from the four perception variables is believed to be affected by modifying factors such as demographic and sociopsychological variables. In essence, the HBM examines health behavior in terms of an individual's psychological readiness to take action in combination with the degree to which the individual believes the recommended action will reduce the perceived threat (Becker, 1974).

Empirical studies of HBM in relation to drug use behaviors

In 1974, an entire issue of Health Education Monographs was dedicated to "The Health Belief Model and Personal Health Behavior" (Becker, 1974). Findings from HBM research were reviewed in this monograph and the author cited considerable support for the HBM in explaining health actions. Since then, the HBM continues to be a leading conceptual framework for understanding and predicting health and medical care behaviors (Rosenstock, 1990). Of all the basic elements of the HBM, the dimensions that have received the most empirical testing include perceived susceptibility, perceived severity, perceived benefits, and perceived barriers (Janz and Becker, 1984; Harrison, Mullen, and Green, 1992). The other elements, namely action cues and modifying factors, have received the least attention in the empirical literature using the HBM. Although the action cues may be instrumental in facilitating the "appropriate"

behavior, this category has seldom been included in studies that used the HBM as a theoretical framework. A large number of studies, performed in many types of settings with varying research designs, have used the HBM to explain prevention, illness, and sick role behaviors. Since this research effort has a primary emphasis on sick role behaviors, two primary review articles summarizing HBM research will be presented with particular emphasis on findings involving sick role behaviors.

Janz and Becker (1984) summarized HBM research over a 10-year period (1974-1984) and also reviewed selected findings prior to 1974 in order to assess the HBM's overall performance. In their review of HBM studies published between 1974 and 1984, the authors employed the following inclusion criteria: (1) each study had to include at least one behavioral outcome; (2) only studies that examined the four primary HBM perception variables; and (3) only studies involving medical conditions and adults, thus excluding dental studies and studies with children. On the basis of these criteria, 29 HBM-related studies published between 1974 and 1984 were included in their review. In addition, 17 studies prior to 1974 were also included. In total, 46 studies were summarized: 18 prospective and 28 retrospective. The 46 studies covered different types of health behaviors: preventive health behaviors (24), sick role behaviors (19), and clinic utilization (3).

Significance ratios (SR) were calculated by dividing the number of positive, statistically significant findings of a HBM dimension by the total number of studies reporting significance levels for that dimension. In general, the authors found considerable support for the HBM with prospective results being generally as strong as retrospective ones (Janz and Becker, 1984).

In the 19 studies examining sick role behaviors, which included compliance with hypertension regimens, Janz and Becker (1984) found the perceived barriers dimension (SR=92%) of the HBM to be the most powerful predictor of compliance behavior, followed by the perceived severity (SR=88%) and the perceived benefits (SR=80%) dimensions. The perceived susceptibility category (SR=77%) was found to be the weakest predictor of compliance, although this may be due to the difficulty of operationalizing vulnerability when individuals already have the disease (Janz and Becker, 1984). Until recently, Janz and Becker's (1984) review represented the only formal attempt to offer conclusions about the overall predictive validity of the HBM. However, in questioning the conclusions drawn by Janz and Becker (1984), a second examination of HBM variables was carried out by Harrison and his colleagues (1992).

Harrison et al. (1992) conducted a meta-analysis of the relationships between the four HBM dimensions and health behavior. They applied similar inclusion criteria to those

employed by Janz and Becker (1984) with one notable
exception: the studies had to include some measure of
reliability. Only 16 studies met the criteria for
inclusion, most of these studies were not included in the
Janz and Becker (1984) review. Mean effect sizes were
calculated across all studies and for subcategories of
studies which were grouped by study design (Prospective and
Retrospective) and by type of dependent variable (Screening
Behaviors, Risk Reduction Behaviors, and Adherence to
Medical Regimens) resulting in 24 mean effect sizes. Of
these 24 mean effect sizes, 22 were found to be positive and
statistically significant. Significant differences were
found between prospective and retrospective designs. For
example, for retrospective designs, perceived benefits and
perceived costs had larger effect sizes and perceived
severity had smaller effect sizes. However, homogeneity was
rejected in 15 of the 22 effect sizes, indicating that the
same construct was not being measured across studies.

Overall, the mean effect sizes of four HBM dimensions
ranged from 0.01 to 0.30. Accordingly, the authors
concluded that any one of the HBM dimensions could not
explain more than 10% of the variance in health behavior.
In regard to adherence to medical regimens (including
antihypertensive regimens), the mean effect sizes for each
dimension ranged from 0.10 to 0.21. Thus, any one dimension

of the HBM could explain no more than 5% of the variance in compliance with medical regimens.

The two reviews are seemingly at opposite ends of a continuum in that Janz and Becker (1984) present a more favorable view of the HBM compared to Harrison et al. (1992). Nevertheless, there is some agreement between the two. Both reviews show that HBM variables are significantly related to health behavior. However, the strength of these relationships across different study designs and health behaviors represents the primary point of departure between the two reviews.

Harrison et al. (1992) argued that the use of significance ratios by Janz and Becker (1984) led to biased evaluations of the studies since significance ratios are affected by factors such as effect size, sample size, and homogeneity of variances across studies. These differences in methodologies used by Harrison et al. (1992) and Janz and Becker (1984) seemingly led to very different conclusions. In addition, the lack of homogeneity found among 15 of the 22 significant mean effect sizes led Harrison et al. (1992) to question the validity of Janz and Becker's (1984) summary of HBM studies. One possibe source of the problem is that Janz and Becker (1984) included HBM studies regardless of whether reliability was assessed or not.

These related issues of effect size and homogeneity are evident in the criticisms that have been leveled against the

HBM since its inception. Although they are necessarily related, each issue is taken separately for the sake of discussion. In the first case, the HBM has been criticized for its lack of ability to explain significant amounts of variance in health behavior, suggesting that additions to the model may be necessary. Some research has demonstrated the value of adding other variables such as self-efficacy and social norms to the HBM, thus improving its predictive power (Ried and Christensen, 1988; Bandura, 1977). However, in defense of the HBM, Janz and Becker (1984, p. 44) argued that "it is important to remember that the HBM is a psychosocial model; as such, it is limited to accounting for as much of the variance in individual's health-related behaviors as can be explained by their attitudes and beliefs." The second issue of homogeneity of variance across studies has also been a criticism of the model. Lack of homogeneity of variances may be a result of the lack of standardized instruments of HBM variables. As a result, researchers have developed their own approaches to operationalizing HBM variables, resulting in problems with the interpretation and comparison of findings across studies (Janz and Becker, 1984; Harrison, Mullen, and Green, 1992).

Culture and Drug Use Behavior

Culture and health beliefs

Although there is no universally accepted definition of culture (Goodenough, 1981), for the purposes of this

research, culture is defined as the learned ways in which individuals were taught to perceive and react to their world (Henderson and Primeaux, 1981). Culture is not necessarily an inherited biological attribute, but it is a set of beliefs or standards that reflect the ways in which people have learned to adapt and survive in their contextual world. Accordingly, culture is the result of both natural and environmental influences (Tosi, Rizzo and Carroll, 1990). These influences create the emergence of a fundamental set of values and beliefs regarding what kinds of behavior are appropriate in given contexts (Goodenough, 1981). In essence, culture constitutes a system of standards for behavior relevant to a particular situation. An assumption underlying this research effort is that African Americans and White Americans differ culturally due to differences in life chances and experiences (Willie, 1979; Willie, 1980; Reimers, 1984).

Goodenough (1981) proposed that an individual's overall culture is made up of different "subcultures." These components of culture or "subcultures" are assumed to be abstracted from higher level individual principles and standards that dictate which system of behaviors are appropriate for a given situation (Goodenough, 1981). These subcultures become more or less relevant depending upon which level a person is functioning at given a particular situation. Thus, individuals can be thought of as being

"multicultural" since they can choose which standards for behavior are appropriate given the situation in which they are functioning. This idea is exemplified in Goodenough's (1981) concept of "operating culture."

Operating culture has been described as an individual selecting the culture in which (s)he wishes to operate for any given situation. Goodenough (1981, p. 99) points out that "this is frequently the case among educated Americans of foreign parentage or among people who have gained acceptance in a higher social class than that in which they were raised as children." For example, the beliefs and norms for behavior associated with an individual's personal life (i.e., personal subculture) may not necessarily be the same as those associated with her/his professional life (i.e., professional subculture). Hence, an individual in this country could "profess and practice the ethics of Christianity, of laissez-faire business enterprise, and of power politics, each in its own segregated context, without feeling that" (s)he is "being inconsistent" (Goodenough, 1981, p. 107). In essence, a person, given her/his repertoire of behavioral standards, can selectively choose which cultural principles are appropriate given the situation and the people (s)he is dealing with (Graham, 1981).

One aspect of culture relates to individuals' views about health and illness. In this research effort, beliefs

and values associated with health matters are an element of one's personal subculture and an individual's personal subculture is believed to be largely influenced by her/his ethnic background. These culturally-related beliefs and values guide subsequent behaviors in health and medical care situations.

In a review of sociological, anthropological, and psychological health-related research, Landrine and Klonoff (1992, p. 267) reported that "the health beliefs of White Americans, of ethnic-minority groups in the United States, and of cultures around the world are culturally constituted and situated." As such, the health beliefs of many White Americans and that of many African Americans likely differ, and there are variations in health beliefs and behavior within each of these groups. The intent of this research is not to imply that all African Americans or all White Americans within each group hold the same views about disease and illness. Rather, the intent is to show enough homogeneity, as indicated by culture, within each of these groups to warrant empirical investigation in order to increase understanding of these effects (Landrine and Klonoff, 1992).

In general, White Americans view illness as an internal, circumstantial abnormality that is caused by some natural causal agents such as genes, viruses, bacteria, and stress (Landrine and Klonoff, 1992). In contrast, many

ethnic-cultural minority groups, including African
Americans, view illness as a "a long term, fluid, and
continuous manifestation of long term changing relationships
and dysfunctions in the family, the community or nature as
well as in the relationship between the individual and any
one of these" (Landrine and Klonoff, 1992, p. 268). These
culturally situated health beliefs imply causal agents that
are based in external, supernatural forces. Such views are
not necessarily or totally conducive to drug therapy when
the illness may not be viewed as entirely within them
(Landrine and Klonoff, 1992). As a result, many ethnic-
cultural minority groups have their own remedies for illness
and their own faith healers and root doctors who are
believed to better fulfill their needs. Often times,
African Americans choose alternative medicine because the
practices of folk healers and the usage of remedies are more
consistent with their model of illness and its causes (Snow,
1981). Bailey (1987) argued that the health belief system
and subsequent health care seeking behaviors of many African
Americans was largely derived from historical experience
whereby they were systematically excluded from mainstream
medical services on an explicitly racial basis. It is
believed that this exclusion played a pivotal role in the
employment of alternative mechanisms for obtaining medical
care by many African Americans. Moreover, since religion
was seen as the major means of coping, many approaches to

healing had a spiritual or religious basis (Henderson and Primeaux, 1981). This spiritualism serves as a vital component of folk medicine.

In an ethnographic study of folk beliefs among low-income African Americans in the southwest, Snow (1981) found that their belief system could be categorized into natural and unnatural events. This dichotomy can best be understood in terms of the extent to which the harmony of nature is disrupted. Natural events involved "the world as God made it and as He intended it to be" (Snow, 1981, p. 82). Natural events are characterized by illnesses derived from natural sources (e.g., impurities from air, food, and water) and also from God's punishment, because it is believed to be His will. Natural illnesses include various theories about the conditions of the blood (e.g., hot-cold, thin-thick, high-low). Unnatural events involved, at best, an interruption of God's plan; and, at worst, they represented the work of the devil. Unnatural events included those having to do with the supernatural (e.g., a mojo, roots, hexes, spells). In those cases where the cause of illness is attributed to divine punishment or unnatural sources, it is believed that the physician is useless in that "you cannot fight God or the Devil with drugs" (Snow, 1981, p. 84).

In an illustrative example of folk beliefs and compliance among 54 southern African American hypertensive

females, Heurtin-Roberts and Reisin (1990) found that one group believed in biomedical hypertension and the other group believed in folk-based interpretations of high blood pressure. Folk-based illnesses consisted of two diseases, "high blood" and "high-pertension." "High blood" was described as a disease characterized by the thickness, richness, and hotness of the blood such that the blood rose slowly and remained there for prolonged periods. "High blood" was considered treatable through dietary means such as less spicy foods and the ingestion of folk remedies (e.g., vinegar). These treatments were believed to cool and thin the blood. On the other hand, "high-pertension" was conceived as a blood disorder caused by "the nerves." Thus, "high-pertension" was an episodic, unstable disease caused by emotional excitement and stress. The treatment most amenable for "high-pertension" was one's control over her/his emotions and the alleviation of stress. In relating these health beliefs to compliance (measured by pill counts), the authors found that of the group who believed they had either of the two folk illnesses, 63% complied poorly (pill use < 60%) with antihypertensive treatment compared with 27% of those who believed in the biomedical hypertension (Heurtin-Roberts and Reisin, 1990). In a related study about folk beliefs, Bailey (1987) found that the most influential factor affecting health care seeking behavior among a sample of 203 African Americans was self-

care. Self-care regimens in this study ranged from "living life according to God's standards" to consuming "a pinch of garlic" after meals. In this study, individuals sought formal medical care services only after traditional remedies had been tried and/or folk healers had been consulted. Some participants still maintained their self-care practices even after seeking formal medical help (Bailey, 1987).

Role of social class and ethnicity

Numerous reports have described the disparities between African Americans and White Americans in the United States with respect to income, occupation, and education, three of the major factors utilized for assessing socioeconomic status (Department of Health and Human Services, 1985; Reimers, 1984). On average, blacks have less education than whites. Those with equivalent education have access to fewer job opportunities than whites. Moreover, African Americans with equivalent occupations are likely to be paid less than White Americans (Reimers, 1984). Clearly, these major socioeconomic differentials that persist between African Americans and White Americans affect their respective life experiences and access to and utilization of medical care services (Reimers, 1984). Beliefs are formed on the basis of learning through life experiences and are thus fundamentally related to socioeconomic status. As such, many African Americans necessarily approach health and illness in different ways from the dominant culture (Bailey,

1987). Snow (1981, p. 93) argues that "since many avenues
to advancement are largely closed for African Americans,
they fall back on the cultural system where religion . . .
allows them to deal with a hostile world." This may
partially explains why the beliefs in folk medicine seem
more pronounced in lower-class African Americans coupled
with the recognition that folk belief studies typically are
carried out among selected groups of lower-class urban and
rural populations.

DiMatteo and DiNicola (1982) found that lower-class
people value health less than the middle and upper classes.
These authors speculated that this finding may be the result
of the lower classes having many competing basic needs
(e.g., food and shelter) that are already satisfied among
the middle and upper classes. However, Goering and Coe
(1970), in challenging this victim centered explanation,
found among lower-class blacks and whites that they desired
medical care but were limited by situational constraints.
In addition, the authors found significant differences
between black and white subjects in their utilization of
physician services. Blacks were significantly less likely
than whites to have seen a physician during the year before
the study.

Although the preceding study was conducted over 20
years ago, similar evidence is found today whereby access to
professional medical services for African Americans still

lingers behind that of White Americans (Department of Health
and Human Services, 1985). Snow (1981, p. 79) warns us,
however, that "it would be fallacious to assume that a lack
of professional health care means no health care at all."
It is no wonder that "a viable folk belief system is part of
American black culture" (Snow, 1981, p. 79).

<div align="center">Temporal Orientation Research</div>

Common Models of Time Perspective

Some researchers have examined the role of time
orientation in peoples' choices and actions (Hendriks and
Zeltzer, 1986; Bergadaa, 1990). Three well-known time
models are: (1) the linear-separable, (2) the circular-
traditional, and (3) the procedural-traditional models
(Graham, 1981). The linear-separable model is characterized
by the perception of the linear nature of time, i.e.,
distinct past, present, and future components. This model,
consistent with the Anglo perception of time, incorporates a
heavy future orientation and how time is spent is based on
future desirabilities. Individuals who perceive time in
this way see past time as gone and that it never comes back
(Graham, 1981).

The second model, circular-traditional, portrays time
as a circular system. This model, consistent with the time
perspective predominant in many Latin countries, embodies a
heavy present orientation since time is conceived as a

circular system whereby the same events are repeated according to some cyclical order (Graham, 1981). In this view, time "comes back around" and there is generally no reason to believe the future will be any different from the past (Graham, 1981). In the United States, this perception of time seems most consistent with individuals who are poor and less educated (Harwood, 1981; Graham, 1981).

Finally, the procedural-traditional time model is characterized by a procedure-driven orientation as opposed to a time-driven one (Graham, 1981). In this model, time, in a mathematical sense, is virtually irrelevant to activities undertaken. This perception is typical of Native Americans or American Indians. Things are done when the "time is right" having little or nothing to do with time per se. This model incorporates a profound present orientation.

The Role of Time in American Society

The time orientation of individuals is one of the most powerful influences on how we think and act both as a society and as individuals (Graham, 1981). Time perception is a part of culture, influencing our perception of the world and our ensuing behaviors (Graham, 1981). The way time is perceived has been a distinguishing characteristic among cultures the world over. In western industrial societies, like the United States, much of what we do is heavily embedded in a future orientation. For example, many

American corporations, such as insurance companies, became prosperous only after American society developed a strong sense of future (Gonzalez and Zimbardo, 1985). Graham (1981) argued that the United States, as a society, exhibits a time perspective that is consistent with a linear-separable model of time (i.e., a futuristic society). This emphasis on future orientation was referred to as the "public culture" of the US (See Graham, 1981, p. 107). However, since the United States is made up of several different cultural groups, the traditions guiding their "private cultures" may not necessarily agree with those associated with the dominant culture. Goodenough (1981, p. 107) points out that "other systems of standards associated with a specific subgroup may be used by its members regularly when they deal only with one another." This assertion makes sense intuitively in that an individual's professional endeavors and achievements are largely dependent on the "rules of society." Therefore, one's professional subculture would likely conform to the standards associated with the overall society (i.e., public culture) because this is one domain where much public interaction occurs.

Time Perspective and Operating Culture

Given the meanings of culture and subculture presented earlier, individuals are, in a sense, "multicultural" in

that they mentally house more than one group of standards for behavior (Goodenough, 1981). That is, "a person shares many different cultures with many groups" (Graham, 1981, p. 338) and the particular standards that are deemed applicable are dependent upon the group and the activities involved. Consequently, an individual can choose which culture or set of standards is relevant to a given situation, i.e., the choice of an operating culture (Goodenough, 1981). Since temporal orientation is a part of culture, individuals should be capable of moving from one temporal model to another depending upon the people involved and the particular circumstance (Graham, 1981). Thus, a person can operate under a linear-separable model (future orientation) in professional situations, but operate under one of the other two models (both present orientations) in personal circumstances. For example, the recognition of this ability is useful in explaining why progressive professionals (future oriented) continue to smoke cigarettes (present oriented) despite probable long-term consequences.

Temporal Orientation, Health Beliefs and Health Behaviors

Graham's (1981) and Goodenough's (1981) research suggests that individuals have the capability to operate under a different set of beliefs and time perceptions depending upon the particular context. Likewise, the health component of one's personal subculture is comprised of

health-related beliefs and temporal orientations that guide
subsequent health actions. Temporal orientation is
multidimensional and individuals can move between these
dimensions given a particular situation.

The existing research on general temporal orientation
suggests that individuals who are future oriented will be
more motivated to act in ways to achieve desired future
positions. For example, in a naturalistic inquiry of the
temporal system of French consumers, Bergadaa' (1990) found
that future oriented respondents held an "attitude of
action" in that they actively sought opportunities for self-
improvement. On the other hand, present oriented
individuals held an "attitude of reaction" whereby they
reacted to a situation if or when it occurred. No research
could be identified that explicitly examined individual time
perception specific to health and illness and its
relationship with health beliefs and illness behavior.
However, some research has been conducted involving time
orientation and the use of preventative services. As
expected, it is generally found that future oriented people
are more likely to engage in health promoting behaviors than
those who are less future oriented (Harwood, 1981).
Although the explanation of preventative health practices is
important, it is just as important to understand how the
different dimensions of temporal orientation relate to
disease management as opposed to disease prevention,

particularly among individuals who have chronic diseases like hypertension.

Social Class and Ethnic Variations in Time Perspective

Some evidence suggests that temporal orientation is related to social class (Leshan, 1952). For example, Bergadaa (1990) noted that people who have suffered poverty tend to orient themselves in the present. Moreover, other sociodemographic factors such as education seem to influence time orientation (Leshan, 1952). Thus, lower classes and less educated individuals are more past and present oriented than other groups (Leshan, 1952; Bergadaa, 1990). Past experiences influence the temporal orientation of individuals (Bergadaa, 1990). Social class is a part of life experiences and thus a part of culture. Bailey (1987) argued that many cultural attributes found among African Americans such as the significance of spiritualism and an emphasis on present orientation are generally in conflict with mainstream values such as individualism and a future orientation. As discussed earlier, because of the direct correlation of ethnicity and socioeconomic status in this country, it is possible that those things that are attributed to class differences may very well be explained by cultural factors.

Summary

Drug use behavior is a complex and multifaceted phenomenon. Noncompliance can occur with anyone at anytime. Moreover, even though the ultimate behavior (i.e., compliance or noncompliance) manifested by various ethnic groups is similar, the underlying reasons for the behavior may be different.

One troubling aspect with compliance research concerns how compliance is defined. Often, compliance is viewed as a unidimensional view of drug use practices, resulting in patients being described as compliant or not compliant. The general label of "compliance" fails to acknowledge the multidimensionality of drug use behavior, resulting in the loss of vital patient information. Compliance studies have not investigated the role of alternative medicines in patients' treatment decisions. It is conceivable that patients who are labelled as noncompliant by the medical establishment may actually be managing their conditions in ways most consistent with their models of illness. For example, a person may not be "compliant" with her/his prescribed regimen but be perfectly "compliant" with some alternative regimen. In fact, many ethnic minority patients make simultaneous use of both the formal and informal medical care systems (Scott, 1981).

Temporal orientation, as a component of individual belief systems, influences people's preferences for

particular courses of action (Graham, 1981). Whether a person is past, present, or future oriented has been shown to be related to how (s)he thinks, feels, and behaves (Gonzalez and Zimbardo, 1985). In relation to drug use practices, temporal orientation can systematically alter an individual's perceptions of the costs and benefits associated with alternative options. Essentially, time perception plays a key role in an individual's evaluation of a treatment's value which ultimately leads to a preferred course of action.

As was shown in the preceding sections of this review, individual beliefs and perceptions, influenced by culture, can and do serve as primary determinants of drug use practices. What is needed is an understanding of how patient variables (e.g., ethnicity, poverty status, and temporal orientation) are related to patient beliefs and perceptions about health and illness and how these belief systems are manifested in actual drug use practices among hypertensive individuals.

Numerous cognitive models of health behavior have been proposed to explain individuals' health actions in response to medical recommendations [See Cummings, Becker and Maile (1980) and DiMatteo and DiNicola (1982) for reviews]. A common element among all of these conceptual frameworks is the recognition that individual health beliefs and perceptions play principal roles in compliance behaviors. Of these models, one of the most frequently cited and researched is the Health Belief Model (HBM) (Rosenstock, 1966; Becker, 1974; Becker and Maiman, 1975; Janz and Becker, 1984; Harrison, Mullen and Green, 1992). The theoretical framework for this study is the HBM. The rationale for selecting the HBM for this research is twofold. First, the HBM has received empirical support in compliance research (including compliance with medication regimens) using both prospective and retrospective designs (Janz and Becker, 1984; Harrison, Mullen, and Green, 1992). Second, the HBM was chosen because it incorporates individual subjective assessments of health situations and their relationships with health behaviors and actions. The

health behavior to be examined in this research effort is drug use behavior to combat hypertension.

Drug use behavior represents an individual's treatment responses to a diagnosis of hypertension or high blood pressure. This research effort recognizes that a treatment response could involve the use of prescribed antihypertensive medications, as well as the use of alternative or home remedies. The importance of representing drug use behavior in this fashion is that it models the use of two different systems, formal and informal. The use of these systems are supported by Scott's (1981) research among ethnic minority groups where she reported that many participants in her study made concurrent use of both the western medical and traditional or alternative systems. Another treatment behavior to a diagnosis of hypertension could be when a person chooses not to use any medication at all, even under circumstances in which a physician prescribed an antihypertensive medication.

For individuals who use prescribed antihypertensive medication, the pertinent health behavior in this study is the extent to which a person takes the medication as medically prescribed, that is, their degree of "compliance." In the case of home remedies, whether or not people use home remedies is the health action of interest. Individuals exhibiting these health behaviors may be classified as: (1) compliers or noncompliers with prescribed antihypertensive

medication (Rx); or (2) users or nonusers of home remedies (HR). These two types of treatment behaviors represent how the dependent variable in this study--drug use behavior--is operationalized.

As discussed in Chapter 2, peoples' perceptions and judgments of health and medical care situations influence their choices among alternative actions. Beliefs about illness conditions often influence drug use practices (Heurtin-Roberts and Reisin, 1990; Snow, 1981). Understanding how different illness and treatment beliefs relate to different aspects of drug use behavior may be important in devising strategies to improve patient outcomes in culturally diverse populations. The HBM provides a conceptual framework in which relationships between health and treatment perceptions and drug use behavior can be studied in culturally diverse populations.

The Health Belief Model, shown in Figure 1, consists of six dimensions: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action and modifying factors. The most notable dimensions of the HBM, in terms of theoretical propositions and empirical investigations, are the four perception variables (Janz and Becker, 1984; Harrison, Mullen, and Green, 1992). Relationships among these perception variables are hypothesized to represent a decision process that individuals may go through when choosing among alternative
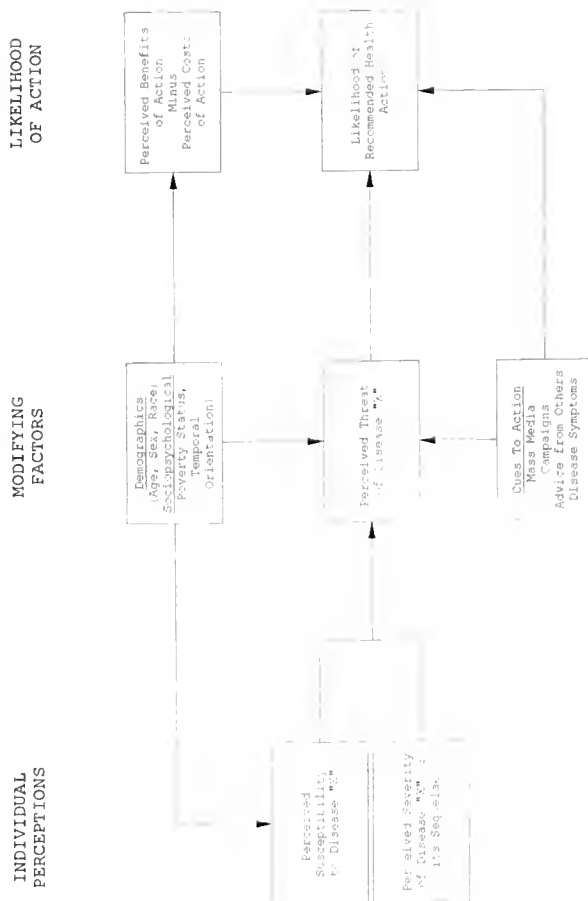
Figure 1.
Health Belief Model

health actions. The model proposes that individual beliefs about severity and susceptibility of a disease and its consequences are associated with engaging in treatment action. Subjective assessments of disease threat are assumed to provide individuals with the motivating force to take action. Once an individual feels substantially threatened by a disease and its sequelae, (s)he must decide among alternative actions. According to the HBM, it is at this point that individuals perform a type of cost/benefit analysis such that alternatives are subjectively evaluated in terms of their benefits and costs (or barriers). This cost/benefit analysis then results in a preferred course of action.

This research, based on cognitive theory, recognizes that when an individual is faced with a choice among alternative behaviors, (s)he will likely choose the alternative that is considered most beneficial relative to the other alternatives in the choice set (Jaccard, 1981; Lynch, 1984). Each treatment alternative is evaluated in terms of the benefits and costs associated with all of the available options. The particular sets of perceived benefits and costs pertaining to each behavioral alternative are believed to jointly influence an individual's preferred course of action, i.e, a person's choice among alternative behaviors. Figure 2 models the hypothesized relationships
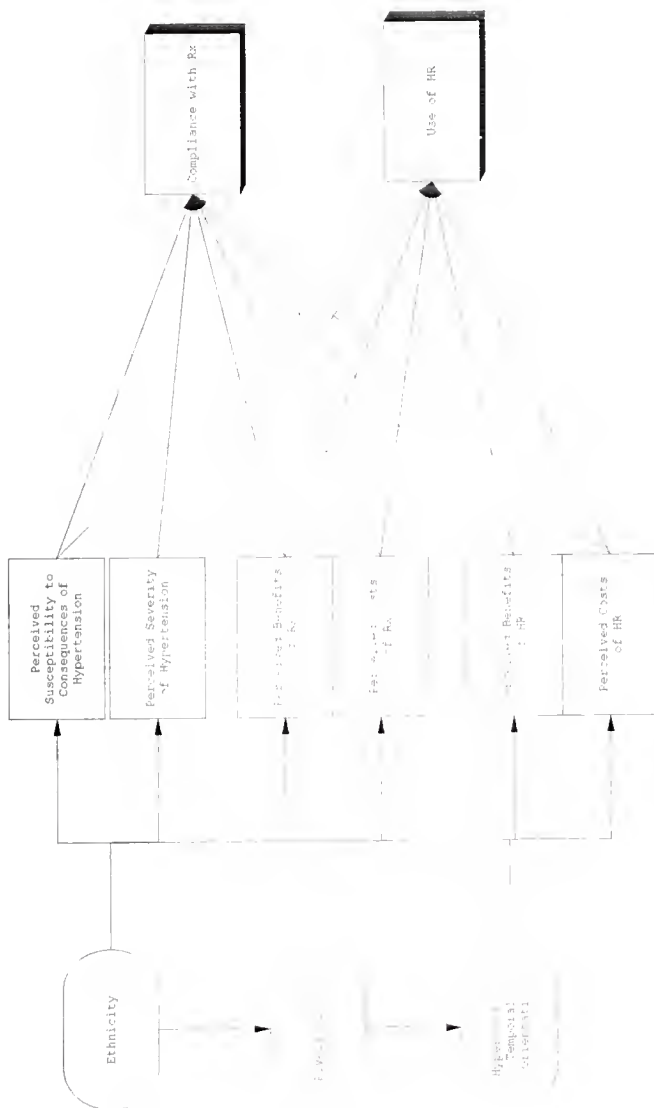
Figure 2.
Study Model

between the four HBM perception variables and the two levels of drug use behavior.

H1:   The more susceptible individuals perceive themselves to be to consequences of hypertension and perceive that hypertension is a serious condition, the greater their likelihood of being compliant with prescribed antihypertensive medication and the greater their likelihood of being users of home remedies.

H2a: Perceived benefits of prescribed antihypertensive medication will increase the probability of being compliant with prescribed antihypertensive medication and perceived costs of antihypertensive medication will decrease the probability of being compliant with prescribed antihypertensive medication.

H2b: Perceived benefits of home remedies will increase the probability of using home remedies and perceived costs of home remedies will decrease the probability of using home remedies.

H3a: Perceived benefits of prescribed antihypertensive medication will decrease the probability of using home remedies and perceived costs of prescribed antihypertensive medication will increase the probability of using home remedies.

H3b: Perceived benefits of home remedies will decrease
the probability of being compliant with prescribed
antihypertensive medication and perceived costs of
home remedies will increase the probability of
being compliant with prescribed antihypertensive
medication.

The two remaining components of the HBM, cues to action
and modifying factors, are not conceptualized as core
elements of the decision process itself, but as catalysts
and shapers of the decision process. Accordingly, the HBM
proposes that some type of internal or external cues to
action are needed to activate this decision process.
Modifying factors such as demographic and sociopsychological
variables are proposed to relate to health actions primarily
through their influences on individual perceptions (Becker,
1974). Cues to action and modifying factors have seldom
been included or explicitly examined in HBM studies (Janz
and Becker, 1984). As such, we lack a clear understanding
of how cues to action and modifying factors relate to health
beliefs and health behaviors. The role of cues to action
will not be assessed in this research. However, the
research hypotheses in the remainder of this chapter focus
on the associations between selected modifying factors and
health perceptions and drug use behavior within the HBM
framework.

The model, in Figure 2, assesses the relationships among the ethnicity of two selected groups, their poverty status, temporal orientation, health-illness and treatment perceptions, and drug use behavior. This theoretical model proposes that ethnic group membership, poverty status, and temporal orientation are related to health-illness and treatment perceptions; and that these health-illness and treatment perceptions are related to drug use behavior. A description of these theoretical constructs and their postulated relationships are discussed below.

Ethnicity and Socioeconomic Status

The race/class debate has been one of the most abiding controversies to be found in the sociological literature (Rex and Mason, 1986). Because ethnicity and socioeconomic status are so closely related in this society, it has been extremely difficult for researchers to separate the two (Harwood, 1981). Although the intention is not to settle this debate here, this research studies the unique influence of ethnic group membership after accounting for socioeconomic status. A study of this contribution is supported by research that has shown that ethnic differences, with attendant cultural differences, persist in divergent health and illness beliefs and ensuing behaviors irrespective of social class and education (Landrine and Klonoff, 1992; Harwood, 1981; Berkanovic and Reeder, 1973;

Suchman, 1964). For example, Suchman (1964) and Greenblum (1974) have found that ethnic differences in health orientations such as knowledge about disease and skepticism about medical care persist across class boundaries. It is not suggested that all members of an ethnic group are homogenous with respect to health beliefs and behaviors. There is considerable variance in the extent to which members of an ethnic group uphold the beliefs and behaviors that are characteristic of their particular ethnic group. However, it is not clear how health beliefs and drug use behaviors are related to only ethnic and cultural factors, only socioeconomic factors, or some combination of the three. Nevertheless, after reviewing multidisciplinary, health-related literature among various ethnic groups, Harwood (1981) and Landrine and Klonoff (1992) suggested that although ethnic differences diminish among members of upper socioeconomic classes, they do not disappear altogether. Based upon their research, the following hypotheses were formulated:

    H4a: Controlling for poverty status, the severity of hypertension will be rated higher among African Americans than among White Americans.

    H4b: Controlling for poverty status, African Americans will see themselves as less vulnerable to hypertension consequences as compared to susceptibility beliefs among White Americans.

H4c: Controlling for poverty status, African Americans
will rate the benefits of home remedies and the
costs of prescription medication higher than that
of White Americans.

H4d: Controlling for poverty status, African Americans
will rate the costs of home remedies and the
benefits of prescription medication lower than
that of White Americans.

Temporal Orientation

Temporal orientation is conceptualized as a linear,
multidimensional construct with distinct past, present, and
future components. Temporal orientation, as a part of
culture, is both learned and context-specific and thus
individuals are capable of movement between these three
dimensions given the particular situation. The model,
studied in this research, seeks to examine the relationship
between temporal orientation and health and treatment
perceptions among hypertensive individuals.

It would be valuable to understand the relationship
between temporal orientation and health perceptions
especially among people with hypertension. Because so much
of the value of treating hypertension is focused on some
future health state, it seems likely that individuals
holding different time perspectives concerning hypertension
may very well exhibit notably different perceptions

regarding hypertension and its management. Existing
evidence pertaining to general (not health-specific)
temporal orientation (Leshan, 1952; Bergadaa', 1990; Bailey,
1987; Harwood, 1981) suggests that future oriented
individuals place much more stock in abstract future events
than individuals who are oriented in the present.
Therefore, it is likely that future oriented people would
identify with the benefits of treatment versus costs over
the long run. On the other hand, the costs of treatment may
become magnified among present oriented individuals because
they would likely fail to fully appreciate the benefits
associated with some abstract future. Moreover, because
present oriented people tend to rely on pragmatic life
experiences rather than events in an obscure future, it is
also likely that they may not have thought about their
vulnerability to repercussions of uncontrolled blood
pressure. Based upon these conceptions, the following
hypotheses were formulated:

    H5: Compared to people with more future orientations,
        individuals who are more present oriented on each
        domain of hypertension will see themselves as less
        susceptible to hypertension consequences.

    H6a: More future oriented individuals on each domain of
        hypertension will give greater weight to the
        temporally distant benefits of either prescribed
        antihypertensive medication or home remedies as

compared to the presently salient costs of either
treatment modality.

H6b: More present oriented individuals on each domain
of hypertension will give greater weight to the
presently salient costs of either prescribed
antihypertensive medication or home remedies as
compared to the temporally distant benefits of
either treatment modality.

Hypertension, as a part of one's personal subculture,
is believed to be largely influenced by one's ethnic
background and experiences. Therefore, temporal orientation
related to hypertension may differ among African Americans
and White Americans. Moreover, because temporal orientation
is learned through experiences, African Americans and White
Americans may not be temporally different when it comes to
those things they have not yet experienced. While it is
unknown whether temporal orientation differs among African
Americans and White Americans, there is evidence that
nonspecific temporal orientation differs among levels of
socioeconomic status (Leshan, 1952). This study found that
lower classes tend to orient themselves in the present. The
extent to which these socioeconomic differentials are
related to ethnic differences is unknown. However, in the
United States, the popular concept of "C.P. Time" is a
consistent indication of the cultural difference of the
Black-White concept of time (Houston, 1990). "C.P. Time" is

an acronym for "colored peoples' time" and it is characterized by an expectation that African Americans will be "late" in relation to some prescheduled time.

Several authors have supported the belief that there are commonalities (e.g., time perception) that unite African Americans which have origins in African culture [See Anderson (1989) for a review]. For example, Houston (1990, p.21) argued that the difference in the conceptualization of time by African Americans can best be understood "within the religious ontology of African life and viewed as a vestige of African culture that has survived the obliterating effects of Western influence." He based this assertion on research conducted by Mbiti (1969) who interpreted that African time consists of phenomena that have already occurred (past), those that are currently taking place (present), and those that are to transpire immediately (immediate future). In essence, African time is viewed as bidimensional--past and present--with a slight degree of future. Houston (1990, p. 21) argued that, for the African, the distant future is "an almost incomprehensible concept," because the events symbolizing its existence have not occurred. These African time perceptions seem salient among many African Americans, although there is some individual variation with regard to the degree of influence these African cultural traditions have on the behavior of modern African Americans (Anderson, 1989). Based upon the

preceding information, the following hypotheses were constructed:

H7a: Controlling for poverty status, African American subjects will be more present oriented and less future oriented than White American subjects on the two experiential domains of hypertension.

H7b: Controlling for poverty status, African Americans and White Americans will not differ in temporal orientation on the nonexperiential domain of hypertension.

As described earlier in this chapter, the HBM proposes that modifying factors influence health actions primarily through their influences on health perceptions. As such, demographic and sociopsychological factors are not believed to have any direct influences on health action. The following hypothesis was based on this HBM proposition:

H8: The addition of demographic and sociopsychological variables (i.e., ethnicity, poverty status, and temporal orientation) into the logistic regression model will not significantly change the probabilities of either level of drug use behavior once the effects of the health perceptions have already been taken into account.

This section delineates the methods and procedures that were used in this study in order to meet the research objectives. They include sample selection, data collection, nonrespondent bias, study variables, instrument development and validation, data analysis, and limitations.

Sample Selection

The pool of subjects for this research was individuals with hypertension residing in the northern and central northern counties in the state of Florida. The northern section of Florida was particularly relevant to this research since it is contained in the southeastern region commonly referred to as the "Stroke Belt" region of the country (Siegel, et al., 1992). Moreover, these northern Florida counties have aggregated stroke mortality rates higher than that of other states contained in the "Stroke Belt" region. In this research, stroke mortality rates were used as a marker for hypertension incidence in the study counties. From this population, a random sample of subjects were selected according to the following inclusion criteria:

1) The individual must have been diagnosed by a physician as having high blood pressure;

2) The individual patient must have had high blood pressure for at least one year;

3) The individual must have been prescribed at least one antihypertensive medication; and

4) The individual must not have experienced nor currently be experiencing any complications (e.g., kidney disease, stroke, heart attack, blindness) of uncontrolled hypertension.

These inclusion criteria were developed after extensive discussions about key methodological and conceptual factors relevant to this research. For example, the fourth criterion was generated after an examination of the perceived susceptibility to consequences of uncontrolled hypertension construct, a primary variable in this research. Among individuals who are experiencing or who have already experienced these consequences, this construct would probably be meaningless. The sample was stratified post hoc based upon certain preselected categories:

1) Poverty status as indicated by age of head of household, household size, and household income. Respondents were classified as either above, within or below the poverty threshold according to guidelines developed by the U.S. Department of

Commerce criteria for 1993 (Bureau of the Census, 1994).

2) Ethnic group membership as indicated by self-identification. The sample included approximately equal numbers of two selected groups, African American and White American individuals with hypertension.

3) Geographic locale as indicated by residence in either metropolitan or nonmetropolitan counties as defined by the US Department of Commerce (Bureau of the Census, 1993).

Data Collection Procedures

The research was non-experimental employing a cross sectional design. Data collection was conducted via telephone interview methods by a local marketing research firm. It is believed that this procedure did not bias the sample significantly since approximately 98% of US households have telephones (National Center for Health Statistics, 1987). The telephone methodology was chosen for data collection because of the nature of the dependent variable being studied. Given the conceptualization of drug use behavior in this study, it was important to include those individuals who have been medically diagnosed as having hypertension and prescribed an antihypertensive medication, but who are perhaps not currently engaging in

follow-up physician visits or not taking prescribed
antihypertensive medications. It is for the aforementioned
reasons that the study sample was not solicited from
physicians' practices or pharmacy practices because these
methods would exclude the types of individuals described
above.

Data were collected over a period of approximately
three weeks, from January 30 to February 16, 1994. A random
sample of five thousand subjects residing in the northern
and north central counties of Florida was purchased from a
sampling house. Individuals were contacted by phone by
trained interviewers between the evening hours of five and
nine on Monday through Friday. A comprehensive log of the
results of each telephone contact was kept (answering
machine, no answer, busy, refusal, etc.). Four attempts
were made to contact those individuals who were not
contacted initially. Each interviewer utilized the
computer-assisted telephone interview (CATI) system for data
entry. The CATI system enabled interviewers to directly
enter responses into the computer for immediate creation of
the data base.

All interviews began with the identification of the
interviewers including their names, where they were calling
from, and what the calls were about. The next step was to
ascertain whether or not an adult within the household had
hypertension and, if appropriate, ask to speak with that

individual. Potential respondents were then given a brief introduction about the study and an assurance of confidentiality. Participation in this study was voluntary and verbal consent was obtained from each study participant. Written informed consent was not required since an exemption was granted by the Health Science Center Institutional Review Board (IRB) at the University of Florida.

Once the individual had verbally consented to becoming a potential respondent, the interviewer began the screening process in order to verify that the participant met the criteria for enrollment. This was done through the application of the "screener" developed for this study (See Appendix D). The screener included all of the aforementioned study criteria as well as questions on ethnic identity, county and city of residence. When respondents met all of the screening criteria, the application of the study instrument immediately followed. When respondents did not meet at least one of the screening criteria, they were thanked for their willingness to participate and the contacts were immediately terminated. This process continued until 300 individuals were obtained who both qualified and agreed to participate.

Each interview took an average of 20 minutes to complete. Each respondent was asked a series of questions contained in the survey instrument developed to measure the various constructs: 1) Ethnicity, 2) Poverty Status, 3)

Temporal Orientation, 4) Health and Treatment Perceptions, and 5) Drug Use Behavior (See Appendix D for survey).

At least 300 respondents were needed in this study in order to evaluate the research hypotheses. This sample size estimate was based on achieving a statistical power of 0.80, a Type I error rate equal to 0.05, and an effect size of 2% for individual effects in a model explaining 23% of the variance in total (Keppel, 1991). In other words, at an alpha level of 0.05, there was an 80% chance of detecting differences on the estimated smallest effect size of 2%. Moreover, this sample size was estimated on the assumption that the study model would explain at least 23% of the variance in drug use behavior as suggested by the literature.

Nonrespondent Bias

A total of 2442 contacts were made during the data collection period. This total included completed interviews, ineligible contacts, and all refusals. Individuals who had hypertension and refused to participate were logged as high blood pressure refusals. These individuals comprised the nonrespondent group of interest in this research. Of the 753 total hypertension contacts, 66 people were logged as refusals which resulted in a refusal rate of 8% among hypertensives. This refusal rate was

calculated by dividing the number of high blood pressure refusals by the total number of contacts with hypertensives.

Study Variables

Dependent Variables

Although the four perception elements of the Health Belief Model (HBM) have been studied extensively, there are no current standardized measurements of these variables. Accordingly, the items for HBM model variables in this study were developed through the use of pilot interviews along with information in the literature.

Perceived severity of hypertension

Perceived severity is the degree to which an individual believes hypertension to be a serious disease. Perceived severity was measured in terms of the seriousness of hypertension, the fear of having hypertension, and the limitation that hypertension imposes on social activities. Each of the three dimensions was measured on a 5-point Likert-type scale anchored by 1 "Strongly Agree" and 5 "Strongly Disagree" with 1 representing the strongest belief on each dimension.

Perceived susceptibility to consequences of hypertension

Perceived susceptibility is the degree to which an individual perceives her/himself to be vulnerable to consequences of uncontrolled hypertension. Perceived susceptibility was measured by the extent to which

individuals believed it is probable that they would
experience a stroke, heart attack, or kidney problems and by
their estimate of how much at risk they were to having a
stroke, heart attack or kidney problems. Susceptibility
scores were summed over two items requiring a response to a
5-point Likert-type scale anchored by 1 "Strongly Agree" and
5 "Strongly Disagree." A score range of 2 to 10 was
possible with 2 representing the highest belief on perceived
susceptibility.

Perceived benefits of antihypertensive medication (Rx)

Perceived benefits of antihypertensive medication (Rx)
represented the degree to which respondents believed their
medication to be effective in controlling high blood
pressure and preventing adverse consequences. Perceived
benefits of Rx were measured in terms of the medication's
ability to control high blood pressure, to prevent strokes,
heart attacks, and kidney disease, and to ease one's mind
about having high blood pressure. Benefits of Rx scores
were summed over three items, each on a 5-point Likert-type
scale anchored by 1 "Strongly Agree" and 5 "Strongly
Disagree." A score range of 3 to 15 was possible with 3
representing the highest belief on perceived benefits of Rx.

Perceived costs of antihypertensive medication (Rx)

Perceived costs of antihypertensive medication (Rx)
represented the degree to which an individual believed there
are barriers (or costs) associated with the use of

antihypertensive medication. Perceived costs of Rx were measured in terms of paying for the medication (financial), forgetting to take the medication, problem obtaining refills, and experiencing side effects from the medication. Each of the four dimensions was measured on a 5-point Likert-type scale anchored by 1 "Strongly Agree" and 5 "Strongly Disagree" with 1 representing the strongest belief on each dimension.

Perceived benefits of home remedies (HR)

Perceived benefits of home remedies (HR) represented the degree to which an individual believed home remedies were effective in controlling high blood pressure and preventing adverse consequences. Perceived benefits of HR were measured by beliefs about home remedies' effectiveness in controlling high blood pressure and by their ability to keep the body and blood balanced. Benefits of HR scores were summed over two items requiring a response to a 5-point Likert-type scale anchored by 1 "Strongly Agree" and 5 "Strongly Disagree. A score range of 2 to 10 was possible with 2 representing the highest belief on perceived benefits of HR.

Perceived costs of home remedies (HR)

Perceived costs of home remedies (HR) represented the degree to which an individual believed there are barriers (or costs) associated with the use of home remedies. Perceived costs of HR were measured in terms of the lack of

physicians' acceptance of using HR, the lack of comfort with discussing HR use with their physicians, and the lack of efficacy of HRs compared to prescription medication. Each of the three dimensions of costs of HR was measured on a 5-point Likert-type scale anchored by 1 "Strongly Agree" and 5 "Strongly Disagree" with 1 representing the strongest belief on each dimension.

Drug use behavior

Drug use behavior is an individual's treatment response to a diagnosis of hypertension or high blood pressure. A treatment response could involve the use of prescribed antihypertensive medications, as well as the use of home remedies. Individuals exhibiting these health behaviors may be classified as: (1) compliant or noncompliant with prescribed antihypertensive therapy; or (2) users and nonusers of home remedies.

Compliant respondents were those individuals who reportedly took their medications every day as medically prescribed during the 30-day reference period. Noncompliant respondents were those individuals who reported one day or more of not taking their medication as prescribed within the reference period of 30 days. Compliant and noncompliant categories were measured by the question, "In the last 30 days, how many days have you taken your high blood pressure medication exactly as your doctor prescribed?" Those who answered 30 were classified as compliant and those who

answered 29 or less were classified as noncompliant. The compliance measure was originally designed to be a continuous measure, however, not unlike many self-reported compliance measures in the literature, the compliance scores in this study were highly skewed, indicating a dichotomization of the variable. The cutpoint chosen for the dichotomy is similar to that used in other compliance studies (Hershey et al., 1980).

Respondents were also categorized on the basis of whether or not they used home remedies to treat their hypertension. Some examples of home remedies include vinegar, garlic, aloe vera, and vitamins. The use of home remedies was measured by the question: "Besides prescription medication, do you use anything else to treat your high blood pressure?" Those who answered yes were classified as users of home remedies and those who answered no were classified as nonusers of home remedies. Users of home remedies were also asked to name the home remedy they used. This second question was asked to verify that a home remedy was actually being used.

Independent Variables

Ethnicity

Ethnicity is a socially defined state of belonging to a particular subgroup and seen as belonging to that subgroup by others. Ethnicity was measured by self-report on a single item scale requiring one of the following responses:

1) Non-Hispanic Black or African American, 2) Non-Hispanic
White or Caucasian, 3) Hispanic, 4) Asian, or 5) Other.
Only respondents in categories 1 and 2 were eligible for the
study.

Poverty status

Poverty status is a measure of the financial well-being
of an individual in U.S. society. Poverty status was
measured by an algorithmic combination of age of household
head, household size, and household income. The composite
of these three items were then used to classify individuals
as above, within or below the poverty threshold level as
defined by the U.S. Department of Commerce criteria for 1993
(Bureau of the Census, 1994). Estimated poverty thresholds
are single numerical estimates of income rounded to the
nearest dollar. Because it was believed that respondents
would not be able to give such refined estimates of their
incomes, ranges of $1000 were created such that estimated
poverty thresholds were captured within these ranges. For
example, if the estimated poverty threshold was $7517, the
created range was $7000 to $8000. An individual, for which
this range was applicable, would be classified as above the
poverty threshold if her income was greater than $8000,
within the threshold if her income was between $7000 and
$8000, or below the threshold if her income was less than
$7000. Poverty status was chosen to measure financial well-

being because this designation not only reflects income, but also age of household head and size of household.

Temporal orientation

Temporal orientation is defined as the time perspective an individual holds with regard to hypertension and its management. Temporal orientation is conceptualized as having three distinct dimensions: past, present, and future. However, previous research suggests that most Americans primarily hold either present or future orientations (Gonzalez and Zimbardo, 1985). Hence, only present and future dimensions were measured in this research effort.

An eleven item hypertension temporal orientation scale was developed based upon data in the literature and data from the pilot interviews described below. Construct validation procedures of the temporal orientation scale revealed three primary domains of hypertension: a nonexperiential domain, an experiential disease domain, and an experiential treatment domain (See Results chapter). The nonexperiential domain, measured by five items, represented issues that are potential consequences of both hypertension and hypertension management. The experiential disease domain, measured by three items, characterized concerns that are related to the day-to-day dealing with hypertension. The experiential treatment domain, measured by three items, represented day-to-day concerns involving hypertension management (the medication). Each item required a response

to a 5-point Likert-type scale ranging from 1 "Strongly Agree" to 5 "Strongly Disagree." Items within each subscale were summed and then averaged resulting in a possible score range of 1 to 5. Item scores were recoded such that movement towards the low end (1) of each subscale represented a more future orientation and movement towards the high end (5) represented a more present orientation.

Instrument Development and Validation

Pilot Interviews

The initial phase of this project involved the development and validation of the survey instrument to measure: 1) health-specific temporal orientation of patients in regard to hypertension and its management, 2) health and treatment perceptions of patients in regard to hypertension and antihypertensive therapy, and 3) drug use behavior of hypertensive patients with regard to the usage of both prescribed antihypertensive medications and home remedies (see Appendix C).

The questionnaire development process began by conducting in-depth interviews with a convenience sample of seven hypertensive patients. Six respondents resided locally and one respondent lived in another state. Subjects were solicited such that the sample included both African American and White American hypertensives. Participants included three black females, two white females, and two

white males with an age range of forty to sixty years. All respondents had diagnosed high blood pressure for at least ten years with the exception of one white male who had been diagnosed with high blood pressure a little over one year prior to the interview. Each respondent received a monetary incentive for participation. Administrators at local clinics and private practices and churches were contacted and asked to help identify and recruit patients who met the relevant criteria. In addition, they were asked to either distribute or prominently display a statement describing the project so that eligible patients were informed. Patients who were willing to participate were asked to contact the researcher directly so that appointments could be set.

In-depth interviews were conducted with each respondent in order to develop items to be included in the three scales: 1) Health Temporal Orientation, 2) Health and Treatment Perceptions, and 3) Drug Use Behavior. Most interviews took 30 to 45 minutes to complete with the exception of one interview which lasted 75 minutes. The respondents were asked open-ended questions about their health beliefs (including temporal orientation) and their decisions about drug use. Probes were used to tap into other relevant dimensions of each construct and to clarify and elaborate when needed. All interviews were tape recorded. The informants' responses were then content analyzed and coded such that the identified domains could be

captured in scale items. Scale items were also generated from data in the literature.

Pretest of Instrument

In an effort to make survey questions relevant and understandable to hypertensive patients, an expert panel of researchers and practitioners in the area of patient compliance and patient care, respectively, were asked to assess the instrument for content and face validity. Based upon the expert panel's recommendations, questionnaire items were then modified as necessary such that the "language" of the questionnaire, the completeness of items, and the response categories were deemed adequate. The modified instrument was then reassessed by panel members and was considered appropriate for pretest evaluation.

The study instrument was then pre-tested on a different group of 20 hypertensive patients. These respondents also received monetary compensation in exchange for their participation. Ten interviews in the pretest were conducted face-to-face and the remaining ten interviews were conducted over the telephone. The instrument was pretested over the telephone for the last ten interviews because this was going to be the method of data collection for the main study. After each of the first ten interviews, short debriefing sessions were conducted with subjects to assess questionnaire clarity and completeness.

Consent forms were distributed to local pretest participants for written permission to have their pharmacy medication profiles examined. Pharmacy refill records of the 2 months prior to the interview served as an indicator of the validity of patient self-reported prescribed medication practices.

A total of 45 items was selected to represent the independent measures in this study. Items were grouped into scales according to the constructs they were intended to measure. Statistical procedures·were employed to assess the reliability of the instrument. The internal consistency of each scale was calculated to obtain reliability estimates. Reliability of the scales were assessed through the use of Cronbach's coefficient alpha statistic. The coefficient alphas obtained provided an estimate of how consistent subjects performed across items measuring the same construct. A high value of coefficient alpha indicates a consistent performance of respondents across items and that the performance is generalizable to other potential items pertaining to the same content domain (Crocker and Algina, 1986). Although what is considered "low" for alpha depends on the purpose of the research (Churchill, 1979), a reliability estimate of 0.50 or 0.60 is considered acceptable (Nunnally, 1978).

An item analysis was also obtained in order to determine the final set of items for the survey instrument.

The decision to retain or delete an item from its respective subscale was based upon the following information: (a) an interitem correlation matrix, (b) a corrected item to total correlation coefficient, and (c) the coefficient alpha estimate if the item was deleted from the scale (Ferketich, 1991).

The interitem correlation matrix provides information about how a certain item relates to other items in the scale. Generally, interitem correlations of 0.30 or higher are desirable (Ferketich, 1991).

Corrected item to total correlations involve the correlation of item score with the total score of the remaining items in the scale under examination. Corrected item to total correlations were calculated to adjust for spurious values that are obtained when the item scores contribute to the total scores (Crocker and Algina, 1986). Corrected item to total correlations are especially relevant when there is a small number of items in the scale (Ferketich, 1991). A more recent rule of thumb for corrected correlations is that they should be 0.50 or greater (Bearden et al., 1989), however, corrected correlations above 0.30 have been considered sufficient (Nunnally, 1978).

The revised coefficient alpha reveals the change in alpha if the item was dropped from the scale. If there is a substantial improvement in alpha when the item is deleted,

this is considered as some support for dropping the item. However, the revised alpha is most informative when it is used in combination with the aforementioned aspects of item analysis.

Pretest Results

Of the twenty pretest participants, sixty percent (N=12) were African American and the remaining forty percent (N=8) were White American. Most (N=15) of the respondents were female. The mean age of respondents was 61.8 years and they had been diagnosed with hypertension for an average of 16.8 years. Fifty percent (N=10) of the respondents had less than a high school education, while the remaining half were at least high school graduates. Moreover, one half (N=10) of the respondents had annual household incomes of less than $10,000 and the other half had incomes of $10,000 or greater.

Psychometric properties of pretest scales

A primary criterion for assessing the quality of each scale was coefficient alpha. If scale items intended to measure a construct indeed came from the same domain, responses to these items should be highly intercorrelated, i.e., internally consistent. The original and revised reliabilities of study scales are reported in Table 4-1. The revised coefficient alpha estimates ranged from 0.32 to

0.87. Based upon acceptable levels of 0.50 or 0.60, only
the costs of Rx scale had low reliability.

Table 4-1
Original and Revised Reliabilities (α) of Pretest Scales

Scale	Original # of items	Original $\alpha =$	Revised # of items	Revised $\alpha =$
Perception Variables				
Severity	4	0.58	3	0.61
Susceptibility	4	0.63	3	0.66
Benefits of Rx	4	0.64	3	0.79
Costs of Rx	5	0.47	4	0.32
Benefits of HR	4	0.79	3	0.87
Costs of HR	4	0.55	3	0.53
Modifying Factors				
Ethnicity	1	NA	1	NA
Poverty Status	1	NA	1	NA
Temporal Orientation				
Nonexperiential	7	0.38	5	0.64
Experiential	9	0.67	6	0.73
Drug Use Behavior				
Compliance with Rx	1	NA	1	NA
Use of HR	1	NA	1	NA

Note: Rx = prescription medication, HR = home remedies, # =
number, NA = not applicable.

Modifications to the scales were made based upon both individual item characteristics and theoretical importance. In addition, instrument length was considered so that telephone interviews could be kept at approximately twenty minutes.

Individual scale items were evaluated in terms of their interitem correlations, item to total correlations, and revised coefficient alphas when an item was deleted from the scale. The decision to delete or retain an item was determined on both psychometric and conceptual grounds. Caution was taken not to eliminate items only on its psychometric characteristics because of the relatively small pretest sample size. The evaluation process of each scale is described below.

Severity scale. The reliability of this four item scale was 0.58 (See Table 4-1). Item Q3, "High blood pressure cannot kill you," was deleted from the scale based upon poor interitem and corrected item to total correlations (See Appendix A). The reliability of the scale increased to 0.61 after the deletion of the item Q3.

Susceptibility scale. This four item scale exhibited a reliability of 0.63 (See Table 4-1). Item Q9, "If I do not take care of myself, there is a good chance that I will suffer from serious health problems caused by my high blood pressure," had low interitem and corrected item to total

correlations (See Appendix A). This item was deleted from the scale and the revised alpha for the scale was 0.66.

Benefits of Rx scale. The reliability of this scale was 0.64 (See Table 4-1). The second item (Q54) of this scale, "My high blood pressure would not get worse if stopped taking my blood pressure medication," was very confusing to respondents. It had been negatively worded in order to decrease any response set bias. However, there was no variance on this item among pretest subjects and, therefore, the correlations of item Q54 were zero (See Appendix A). Item Q54 was deleted from the scale and the revised alpha after the deletion was 0.79 (See Table 4-1).

Costs of Rx scale. The reliability of this scale was 0.47 (See Table 4-1). Responses to item Q60, "Side effects prevent me from taking my blood pressure medication as prescribed," did not vary and, again, correlations were zero (See Appendix A). However, item Q60 was retained for the main study because it was believed that this item would perform better in a larger and more heterogenous sample. Although item Q61, "I do not have trouble keeping up with how often I am suppose to take my blood pressure medication," performed well, respondents had trouble remembering the entire statement during pretest telephone interviews and thus it was deleted from the scale. The revised alpha for this scale was 0.32. Although the reliability was low in terms of an acceptable alpha level of

0.50 or 0.60, these items were chosen for the main study
because they have been shown in the literature to be
important barriers to using prescription medication properly
(See Chapter 2).

Benefits of HR scale. The reliability of this scale
was 0.79 (See Table 4-1). The only poorly performing item
was item Q64, "Folk remedies provide me with immediate
relief since I can feel them working in my body," which had
low interitem and low corrected item to total correlations
(See Appendix A). This item was deleted and the revised
alpha for this scale was 0.87 (See Table 4-1).

Costs of HR scale. This scale exhibited a reliability
of 0.55 (See Table 4-1). Item Q66, "Folk remedies do not
really work over the long run," was deleted based upon poor
interitem and poor corrected item to total correlations (See
Appendix A). Although items Q67, "I believe folk remedies
are not well accepted by my doctor," and Q68, "I feel that I
can discuss using folk remedies with my doctor or other
health care professionals," had poor correlations, they were
retained because of their theoretical and practical
importance. However, item Q67 was reworded because
respondents found it difficult to answer in its original
format. The revised alpha for the scale was 0.53 (See Table
4-1).

Nonexperiential domain scale. This scale had seven
items originally. The reliability of this scale was 0.38

(See Table 4-1). Items Q15, Q23 and Q27 were treatment specific and items Q17, Q19, Q21 and Q25 were specific to hypertension. Items Q21, "I think about potential problems that could occur later with my high blood pressure," and Q25, "I think about how my high blood pressure might affect me in the future," were deleted because of poor interitem correlations (See Appendix A). The correlations on item Q27, "I see taking blood pressure medication as an investment in my future health," were zero since there was no variance in responses on this item. However, upon further evaluation, item Q27 was retained since it was believed that it would perform better in the larger study and more heterogenous population in terms of hypertension temporal orientation. Therefore, five items (3 treatment specific and 2 hypertension specific) remained for the final study. The revised coefficient alpha of this scale was 0.64 (See Table 4-1).

Experiential domain scale. This scale initially had nine items: items Q14, Q22, Q24, Q26 and Q29 were treatment specific and items Q16, Q18, Q20 and Q28 were hypertension specific. The reliability of this scale was 0.67 (See Table 4-1). Items Q16, "I see no sense in thinking about possible problems with my high blood pressure right now because they may not happen," and Q24, "I take my blood pressure medication to keep me healthy now rather than thinking about the future," were deleted because of poor interitem

correlations (See Appendix A). The correlations for items
Q22, "I think it is a waste to take blood pressure
medication when I don't feel like my blood pressure is
high," and Q29, "If I start having problems with my blood
pressure medication, I will just stop taking it," were zero
because there was no variance in responses to these items
(See Appendix A). After further evaluation of both items in
terms of theoretical relevance, item Q22 was retained and
item Q29 was deleted. Moreover, it was believed that item
Q22 would perform better in a larger and more heterogenous
sample with respect to different hypertension temporal
orientations.   Thus, six items (3 treatment specific and 3
hypertension specific) were retained for the main study.
The revised reliability of this scale was 0.73 (See Table 4-
1).

Overall, a total of 11 items was deleted from the
instrument based upon poor interitem correlations, poor
corrected item to total correlations, negative contributions
to the internal consistency of its respective scale, and
poor clarity among pretest hypertensive respondents.

Validity of Self-Reported Medication Use

Overall, the pretest sample reported high compliance
with their medication regimens. In recognition of the
debate about how patients tend to over-report their degree
of compliance with medication regimens, an attempt was made

to validate this measure. After interviews were completed, eleven of the local pretest participants consented to have their pharmacy refill records examined, however, only 9 participant records were reviewed. In the other two cases, pharmacists wanted verbal consent from the patients themselves, but the patients were not available. Nevertheless, the 9 reviewed records included both self-reported compliant and noncompliant individuals.

Patient self-reported compliance in the 30-day reference period prior to the interview was correlated with refill records from the previous two months. From the refill records, a compliance score was calculated by dividing the number of units dispensed by the number of days between refills. The self-reported mean compliance score was 98.8 ± 3.3 and the mean compliance score from refill records was 98.3 ± 11.7. The Pearson correlation coefficient was 0.92 which indicated that patient self-reports were accurate and valid. Considering the average age (61.8 years) and length of having hypertension (16.8 years) for this sample, it was plausible that the patients' medication taking practices had become part of their daily routine. In fact, most participants indicated that they habitually took their medications after brushing their teeth or after eating breakfast. Furthermore, the validity of these results has some support in the literature such that

compliance has been found to be positively related to age and length of having the disease (Klein, 1988).

Data Analysis

The relationships between the independent variables and dependent variables in this study were examined through the use of logistic regression, analysis of variance (ANOVA), and multiple regression procedures. Using multivariate logistic regression procedures, the overall adequacy of the proposed theoretical model was evaluated in terms of the goodness-of-fit of the proposed model in predicting both compliance with Rx and use of HR. Interactive logistic regression modeling was used to test research hypotheses and to determine the most parsimonious model in predicting compliance with Rx and use of HR. The description of tests of proposed research hypotheses are outlined below.

Tests of Research Hypotheses

Health perceptions and drug use behavior

H1: The more susceptible individuals perceive themselves to be to consequences of hypertension and perceive that hypertension is a severe condition, the greater their likelihood of being compliant with prescribed antihypertensive medication and the greater their likelihood of being users of home remedies.

H2a: Perceived benefits of prescribed antihypertensive medication will increase the probability of being compliant with prescribed antihypertensive medication and perceived costs of antihypertensive medication will decrease the probability of being compliant with prescribed antihypertensive medication.

H2b: Perceived benefits of home remedies will increase the probability of using home remedies and perceived costs of home remedies will decrease the probability of using home remedies.

H3a: Perceived benefits of prescribed antihypertensive medication will decrease the probability of using home remedies and perceived costs of prescribed antihypertensive medication will increase the probability of using home remedies.

H3b: Perceived benefits of home remedies will decrease the probability of being compliant with prescribed antihypertensive medication and perceived costs of home remedies will increase the probability of being compliant with prescribed antihypertensive medication.

This set of hypotheses (H1 to H3b) delineates the hypothesized relationships between the health perception variables and drug use behavior, i.e., compliance with Rx and use of HR. Multivariate logistic regression procedures were used to test each of these probabilistic hypotheses. In these analyses, compliance with Rx and use of HR were

treated as separate criterion variables in two multivariate
models. The severity, susceptibility, benefits and costs
dimensions served as predictor variables in each of the
models. Multiple logistic regression models were used to
calculate adjusted regression coefficients, and odds ratios
(OR) and 95% confidence intervals (CI) were calculated from
these coefficients. Statistical significance was determined
at $p < 0.05$.

Ethnicity and health perceptions

H4a: Controlling for poverty status, the severity of
    hypertension will be rated higher among African
    Americans than among White Americans.

H4b: Controlling for poverty status, African Americans will
    see themselves as less vulnerable to hypertension
    consequences as compared to susceptibility beliefs
    among White Americans.

H4c: Controlling for poverty status, African Americans will
    rate the benefits of home remedies and the costs of
    prescription medication higher than that of White
    Americans.

H4d: Controlling for poverty status, African Americans will
    rate the costs of home remedies and the benefits of
    prescription medication lower than that of White
    Americans.

    This set of hypotheses (H4a to H4d) involve ethnic
group differences in health perceptions while controlling

for poverty status. Multivariate analysis of variance (MANOVA) was employed to allow for simultaneous testing of differences in health perceptions (severity, costs of Rx and costs of HR) that comprised of multiple single item measures. Analysis of variance (ANOVA) procedures were used to compare mean perception scores of each ethnic group, controlling for poverty status. In each test, the health perceptions were treated as dependent variables in separate ANOVA models. The t-statistic and its associated p-value were assessed for statistical significance at a level of $p <$ 0.05. Beta coefficients were analyzed to determine the direction of the relationship. Least square means for the ethnic groups were obtained to ascertain their relative positions on the perception variables.

Hypertension temporal orientation and health perceptions

H5:   Compared to people with more future orientations, individuals who are more present oriented on each domain of hypertension will see themselves as less susceptible to hypertension consequences.

H6a: More future oriented individuals on each domain of hypertension will give greater weight to the temporally distant benefits of either prescribed antihypertensive medication or home remedies as compared to the presently salient costs of either treatment modality.

H6b: More present oriented individuals on each domain of hypertension will give greater weight to the presently

salient costs of either prescribed antihypertensive medication or home remedies as compared to the temporally distant benefits of either treatment modality.

This set of hypotheses (H5 to H6b) delineates the hypothesized relationships between the hypertension temporal orientation and health perception variables. Again, the health perception variables served as criterion variables in separate regression models. Perceived susceptibility, perceived benefits, and perceived costs were regressed on each domain of hypertension temporal orientation. An analysis of standardized regression coefficients was conducted to determine the significance at $p < 0.05$ and the direction of the proposed relationships between hypertension temporal orientation and the health perception variables.

For temporal orientation group comparisons, both MANOVA and ANOVA procedures were employed. A number of planned contrasts were conducted between temporal orientation groups in evaluating health perceptions. The first contrast of the FPP (i.e., subjects exhibiting future orientations on the nonexperiential domain, present orientations on the experiential disease domain, and present orientations on the experiential treatment domain) and FFF groups compared present versus future orientations on both experiential domains of hypertension. The second contrast of the FFP and FPF groups compared future/present versus present/future

orientations on the experiential disease and experiential treatment domains, respectively. The next two contrasts involved group comparisons when respondents' orientation differed only on one or the other experiential domain, that is, comparing the FPF group to the FFF group and the FFP group to the FPP group. It turned out that there were no significant differences in group means when respondents' temporal orientation differed only on the experiential disease domain. Therefore, respondents were pooled across the experiential disease domain and only comparisons on the experiential treatment domain are reported. This final contrast compared present orientations (average of groups FFP and FPP) to future orientations (average of groups FPF and FFF) on the experiential treatment domain of hypertension. No contrasts concerning the nonexperiential domain were conducted since all of the groups used in the inferential analyses held a future orientation with respect to the nonexperiential domain. Significant differences were evaluated at $p < 0.05$. Least square means of temporal orientation groups were also obtained to evaluate their relative positions on the health perceptions.

Ethnicity and hypertension temporal orientation

H7a: Controlling for poverty status, African American subjects will be more present oriented and less future oriented than White American subjects on the two experiential domains of hypertension.

H7b: Controlling for poverty status, African Americans and White Americans will not differ in temporal orientation on the nonexperiential domain of hypertension.

These hypotheses involve ethnic group differences in hypertension temporal orientation while controlling for poverty status. MANOVA was used to compare the two ethnic groups on all three temporal orientation domains. Both African Americans and White Americans were compared on their mean temporal responses to each domain of hypertension. Separate ANOVAs were conducted to assess any significant ethnic group differences ($p < 0.05$) of least square means on hypertension temporal orientation.

Modifying factors and drug use behavior

H8: The addition of demographic and sociopsychological variables (i.e., ethnicity, poverty status, and temporal orientation) into the logistic regression model will not significantly change the probabilities of either level of drug use behavior once the effects of the health perceptions have already been taken into account.

To test whether including the modifying factors added significantly to the explanatory capability of the proposed model, two interactive stepwise logistic regressions were run on each level of drug use behavior by forcing the health perceptions in the model and allowing any of the modifying factors to enter. This was an interactive process because

both individual variables and theoretical subsets of
variables were tested for entry into the model. Subsets of
variables were tested for entry because sometimes, even when
individual associations are weak, the variables as a group
could become important predictors of the outcome (Hosmer and
Lemeshow, 1989).

Variable or group entry was based upon the significance
of its scoretest. The scoretest associated with a single
variable or group of variables represents how well that
variable or group of variables discriminate between the two
levels of the dependent variable (Hosmer and Lemeshow,
1989). In a sense, a scoretest can be viewed similarly to
the incremental R^2 in linear regression. In logistic
regression, the significance of the scoretest is evaluated
in terms of its ability to reduce the deviance of a model in
which it is not a part. Again, in a linear regression
framework, deviance is similar to the sum of squared errors
(SSE), i.e, unexplained variation in the dependent variable.
If the scoretest was statistically significant ($p < 0.05$),
the variable or group of variables were allowed to enter the
multivariate model.

Limitations

This cross sectional study represented one point in
time and did not reflect possible changes in individual
perceptions, beliefs, and behaviors over time. In fact, it

is anticipated that if an individual experiences a major
complication of uncontrolled hypertension (e.g., stroke,
heart attack, kidney disease), this experience would have
marked influences on her/his entire belief system with
regard to hypertension, hypertension outcomes, and treatment
behaviors. Further research will include a longitudinal
study of these respondents to assess how their beliefs and
perceptions change with variations in their health statuses.

Another limitation of this study involved the survey
instrument. Study participants may have been constrained in
that all possible alternatives may not have been represented
in survey response categories. A similar limitation deals
with the respondents' model of illness or hypertension
causality. Although individual beliefs about causes of
hypertension have been associated with a variety of
treatment responses (Heurtin-Roberts and Reisin, 1991), it
is unknown if these models of illness are direct
determinants of treatment behaviors. Future research should
seek to assess a causal connection between illness models
and treatment behaviors.

Finally, the single item measures in the severity,
costs of Rx and costs of HR scales introduced difficulty in
establishing the reliability and validity of these measures.
However, confirmation of several of the research hypotheses
did provide some indication of the validity of the single
item measures in this study.

Sample Description

A total of 300 hypertensive individuals residing in the northern section of Florida participated in this study. The characteristics of the sample as a group and by ethnicity are listed in Table 5-1. Fifty-six percent and 69% of the respondents were African American and female, respectively. These numbers are consistent with the extant hypertension prevalence whereby it is most widespread among African American women (National Institutes of Health, 1993). The mean age of respondents was 60 years and they had hypertension an average of 14.6 years with African Americans having hypertension slightly longer than White Americans. Most participants were above the poverty level and had at least a high school education. African Americans were poorer and had relatively less education than the White Americans in this sample. Eighty percent of the African American respondents lived in metropolitan counties and 58% of the White American respondents resided in nonmetropolitan counties.

Table 5-1
Sample Description

Characteristic	Overall (N=300) Freq (%)		Black (N=167) Freq (%)		White (N=133) Freq (%)	
Ethnicity			167	(56)	133	(44)
Gender						
Female	206	(69)	127	(76)	79	(59)
Male	94	(31)	40	(24)	54	(41)
Education						
Less than HS	95	(32)	55	(33)	35	(26)
HS Graduate	88	(29)	46	(28)	42	(32)
Greater than HS	116	(39)	66	(39)	56	(42)
Poverty Status						
Below	75	(25)	54	(32)	21	(16)
Within Threshold	38	(13)	31	(19)	7	(5)
Above	168	(56)	43	(43)	96	(72)
Unknown	19	(6)	10	(6)	9	(7)
Residence						
Metropolitan	190	(63)	134	(80)	56	(42)
Nonmetropolitan	110	(37)	33	(20)	77	(58)
Age[§]	60.3 ± 13.1		60.4 ± 13.4		60.2 ± 12.7	
1st Diagnosis[§]	14.6 ± 10.6		15.5 ± 11.1		13.5 ± 9.9	

§ Reported as Mean ± SD

Note: Freq = frequency, SD = standard deviation

Evaluation of Nonrespondent Bias

Geographic residence was the only known characteristic of those who refused to participate. First, a comparison was made to determine if refusals were dependent on whether an individual was from a metropolitan or nonmetropolitan county. A Chi-square test of independence revealed no significant differences between refusers and nonrefusers (Chi-square = 0.10 , p > 0.70). Second, study participants and refusers were compared across metropolitan and nonmetropolitan counties. Again, no significant differences were found between the two groups (Chi-square = 0.42, p > 0.50). It is not known with certainty that refusers would have responded like the participants, however, based on the information available, there was no reason to suspect there were any particular differences between the groups.

Evaluation of Final Instrument

Thirty-four items were chosen to represent the independent and dependent variables in this study. These items were initially grouped on the basis of the pretest results. For variables with multiple items, the reliability of each scale was calculated using coefficient alpha. Interitem correlations and corrected item to total correlations were also obtained for scale items (See Appendix B). Generally, items that exhibited poor interitem and corrected item to total correlations and lacked positive

contributions to the internal consistency of their assigned scale were subsequently dropped from the scale and new coefficient alphas were calculated. This procedure resulted in the removal of 2 items, susceptibility item C3, "I do not think that I will experience any major problems in the future that are caused by my high blood pressure." and benefits of HR item HRBEN2, "My high blood pressure would not get worse if I stopped using home remedies." In both cases, the removal of each problematic item substantially improved the reliability of its respective scale. There were some exceptions to this procedure whereby scales with low reliabilities were decomposed into single item measures and these are discussed below.

The reliabilities of the final study scales are shown in Table 5-2. Coefficient alpha estimates for perception scales ranged from 0.12 for the severity scale to 0.76 for the benefits of HR scale. Given acceptable coefficient alpha estimates of 0.50 or 0.60 (Nunnally, 1978), three of the 6 perception scales exhibited poor reliabilities.

The severity, costs of Rx, and costs of HR scales had low reliability estimates with corresponding low interitem corrected item to total correlations (See Appendix B). This was not surprising given the nature of these three constructs. Constructs can be characterized as being either formative or reflective (Bollen, 1989). A formative construct, having no real existence on its own, is defined

Table 5-2
Reliabilities of Final Scales

Scales	Number of items	Final Reliability $\alpha =$	Pretest Reliability $\alpha =$
Perception Variables			
Severity	3	0.12	0.61
Susceptibility	2	0.57	0.66
Benefits of Rx	3	0.69	0.79
Costs of Rx	4	0.45	0.32
Benefits of HR	2	0.76	0.87
Costs of HR	3	0.19	0.53
Modifying Factors			
Ethnicity	1	NA	NA
Poverty Status	1	NA	NA
Temporal Orientation			
Nonexperiential	5	0.76	0.64
Experiential Disease	3	0.66	0.73[*]
Experiential Treatment	3	0.63	-
Drug Use Behavior			
Compliance with Rx	1	NA	NA
Use of HR	1	NA	NA

* represents pretest reliability for combined experiential domain of hypertension temporal orientation.

Note: Rx = prescription medication, HR = home remedies, NA = not applicable.

by distinct dimensions that give the construct its meaning. Therefore, there is no real reason why dimensions of a formative construct would be correlated because each defines its own particular piece of the construct. On the other hand, the meaning of a reflective construct is reflected in the dimensions that measure it. Because the dimensions are reflections of the construct, it is expected that these dimensions would be correlated with one another. Being formative constructs, it was not surprising that severity, costs of Rx and costs of HR dimensions had low correlations.

The hypertension temporal orientation scale consisted of 11 disease and treatment-specific items that were intended to tap two dimensions of temporal orientation, nonexperiential and experiential dimensions. Construct validity of the subscales was explored using the factor analysis methods of principal components extraction succeeded by varimax rotation. A number of rules were used to determine the minimum number of factors compatible with the observed temporal orientation scores: (1) eigenvalue greater than one when the unadjusted correlation matrix is decomposed; (2) the criterion of substantive importance; and (3) the criterion of interpretability and invariance (Kim and Mueller, 1978). The factor analysis yielded results that were psychometrically inconsistent with the original two factor interpretation. A three factor model of hypertension temporal orientation resulted from the factor

analysis (See Table 5-3). Three factors explained 40% of the variance.

Table 5-3
Factor Analysis of Temporal Orientation Scale

Item Number	Factor 1	Factor 2	Factor 3	h^{2a}
1	0.053	0.126	$0.596^§$	0.374
2	0.682§	0.002	0.109	0.477
3	0.780§	0.104	0.043	0.620
4	0.049	$0.644^§$	0.023	0.418
5	0.537§	0.056	0.130	0.308
6	0.013	$0.699^§$	0.110	0.501
7	0.080	0.029	$0.622^§$	0.394
8	0.525§	0.059	0.005	0.279
9	0.172	0.179	$0.544^§$	0.358
10	0.594§	0.144	0.153	0.397
11	0.069	$0.501^§$	0.246	0.316
σ^b	2.980	1.881	1.331	

a Communality (sum of squared factor loadings for each variable).

b Eigenvalue of factor matrix from unaltered correlation matrix.

§ Indicates a significant item loading on its respective factor.

Note: Factor 1 = Nonexperiential Domain, Factor 2 = Experiential Disease Domain, Factor 3 = Experiential Treatment Domain.

According to the factor analysis results of the temporal orientation items, hypertension temporal orientation can be clustered into three groups. The first factor, called nonexperiential domain, represented issues that are potential consequences of both hypertension and its management. Items characterizing the nonexperiential domain

included: (Item 2) I treat my high blood pressure now so that I can avoid future problems; (Item 3) The way high blood pressure affects me in the future is important to me; (Item 5) It is important to me to avoid future health problems caused by my high blood pressure; (Item 8) I take my blood pressure medication mainly to have good health later on; and (Item 10) I see taking blood pressure medication as an investment in my future health.

The second factor, called experiential disease domain, involved the day-to-day dealing with hypertension. The experiential disease domain items included: (Item 4) I only live day-to-day with my high blood pressure without thinking about how it might affect me in the future; (Item 6) I will deal with any problem with my high blood pressure if it happens, but I do not think about it before it happens; and (Item 11) I don't think about having high blood pressure unless it starts to bother me.

The third factor, called experiential treatment domain, involved issues related to the day-to-day management of hypertension. The experiential treatment domain was represented by the following items: (Item 1) As long as I am feeling good now, it is not important to use any kind of medicines for my high blood pressure; (Item 7) I think it is a waste to take blood pressure medication when I don't feel like my blood pressure is high; and (Item 9) If I did not

take my blood pressure medication for a week, it would not bother me.

Apparently, people with hypertension tended to think about their disease and its management in terms of familiarity, i.e., things experienced versus those that had not been experienced. Moreover, hypertensives tended to have more refined conceptions regarding issues that were most familiar to them since they seemingly were able to cognitively separate the experiential context of hypertension into both disease and treatment components. Because of the small pretest sample size, no statistical analysis was undertaken to examine the emergence of these factors. However, the pattern of responses to the pretest instrument and in the debriefing sessions invited some speculation concerning the two factor model of temporal orientation. This evidence reinforced the need to examine the construct validity of hypertension temporal orientation in the final study.

The three factor model of hypertension temporal orientation was conceptually related to the two original dimensions except that items from the second a priori dimension, experiential domain, were split between two factors, experiential issues related to hypertension and experiential issues related to hypertension treatment. Items were assigned to subscales based on primary factor loadings as shown in Table 5-3. The coefficient alpha

estimates for the subscales ranged from 0.63 to 0.76, indicating acceptable levels of internal consistency among the subscale items (See Table 5-2).

Health Perceptions and Hypertension Temporal Orientation

Table 5-4 lists the means and standard deviations of the study variables for all subjects and by ethnicity. For the perception scales, a low number represented a stronger belief on that dimension. Respondents believed that hypertension was a serious disease, however, they were neutral on the fear component and reported a low level social limitations from hypertension. They felt susceptible to hypertension consequences (e.g., stroke, heart attack, kidney disease, and blindness). Respondents believed that prescription medication (Rx) was effective in controlling their high blood pressure, however, none of the costs associated with prescription medication were problematic for this sample. They were neutral about the effectiveness of home remedies (HR) in controlling high blood pressure. Respondents believed that home remedies were not well accepted by their doctors, however, they tended to feel comfortable discussing home remedy use with their physicians. Finally, they did not believe home remedies were as effective in controlling high blood pressure as their antihypertensive prescription medication.

Table 5-4
Means and Standard Deviations of Study
Variables for All Subjects and by Ethnicity

Variables	Overall (N=300) Mean§ ± SD	Black (N=167) Mean§ ± SD	White (N=133) Mean§ ± SD
Perception Variables			
Severity			
Seriousness	1.2 ± 0.7	1.2 ± 0.7	1.2 ± 0.8
Fear	3.0 ± 1.5	2.9 ± 1.5	3.1 ± 1.5
Limitations	3.7 ± 1.5	3.6 ± 1.5	3.7 ± 1.5
Susceptibility¶	4.0 ± 2.1	4.1 ± 2.1	3.8 ± 2.1
Benefits of Rx¶	4.4 ± 2.0	4.5 ± 2.1	4.3 ± 1.8
Costs of Rx			
Financial	3.5 ± 1.7	3.3 ± 1.7*	3.7 ± 1.6*
Forgetting	4.3 ± 1.2	4.2 ± 1.3*	4.5 ± 1.1*
Refills	4.6 ± 1.0	4.5 ± 1.0	4.7 ± 1.0
Side Effects	4.4 ± 1.2	4.3 ± 1.3**	4.6 ± 1.0**
Benefits of HR¶	6.1 ± 2.5	5.8 ± 2.5*	6.5 ± 2.3*
Costs of HR			
Lack MD acceptance	2.2 ± 1.3	2.2 ± 1.3	2.2 ± 1.2
Lack MD discussion	3.9 ± 1.2	4.0 ± 1.2	3.9 ± 1.2
Lack Efficacy vs Rx	2.3 ± 1.2	2.2 ± 1.2	2.4 ± 1.2
Modifying Factors			
Temporal Orientation			
Nonexperiential	1.4 ± 0.5	1.3 ± 0.5	1.4 ± 0.5
Experiential Dz	2.9 ± 1.2	2.9 ± 1.3	2.9 ± 1.2
Experiential Tx	1.6 ± 0.9	1.8 ± 1.0***	1.4 ± 0.7***
Drug Use Behavior			
Compliance with Rx[a]	91.2 ± 25.4	90.3 ± 25.7	92.2 ± 25.1
Use of HR[b]	9.1 ± 25.0	10.2 ± 24.0	8.1 ± 26.2

§ Low numbers indicate a stronger belief on that dimension for the perception variables and a more future perspective on the temporal orientation variables.

¶ Score range of 2 to 10 for Susceptibility and Benefits of HR, score range of 3 to 15 for Benefits of Rx and score range of 1 to 5 for all other perception and modifying variables.

a Reported as number of days taken as prescribed divided by 30 days

b Reported as number of days used divided by 30 days

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.0001$

Note: Rx = prescription medication, HR = home remedies, MD = physician, vs = versus, Dz = disease, Tx = treatment, SD = standard deviation

The mean scores on the three factor model of hypertension temporal orientation are shown in Table 5-4. The low end of each scale depicts a future orientation whereas the high end represents a present orientation. Respondents were more future oriented regarding the nonexperiential domain of hypertension. Similarly, their beliefs about the experiential context involving their treatment practices (experiential treatment domain) were also consistent with a future perspective. However, when it came to their beliefs about their experiences with hypertension (experiential disease domain), respondents were more inclined to orient themselves in the present.

As shown in Table 5-4, there was some preliminary evidence for ethnic differences in perceptions and temporal orientation. African Americans indicated a higher burden of costs of Rx and a stronger belief in the benefits of HR as compared to White Americans. In addition, African American respondents were more present oriented than White Americans on the experiential treatment domain of hypertension. Similar results were found in the multivariate tests of study hypotheses and are discussed further in a later section.

Patient Self-Reported Drug Use Behavior

The means and standard deviations of the dependent variables are also listed in Table 5-4. Most respondents

reported perfect compliance during the 30-day reference period prior to data collection. The highest possible response for compliance (100%) was less than one standard deviation (SD = 25.4) above the mean of 91.1, thus indicating a distribution that was highly skewed to the left. This measure was subsequently dichotomized into compliance (100%) and noncompliance (<100%) with prescription medication. Seventy-seven percent (N=230) was classified as compliant and 23% (N=70) as noncompliant. African Americans (29%) were more likely to be noncompliant with prescription medication than were White Americans (17%) (Chi-square = 6.2, p = 0.01).

Regarding the use of home remedies, most respondents reported that they did not use home remedies to treat their high blood pressure. As shown in Table 5-4, respondents used home remedies an average of 9 days in the 30-day reference period. Unlike compliance, this distribution was skewed to the right whereby the lowest response (0%) was less than one standard deviation (SD = 25) below the mean of 9.1, again supporting a dichotomization of the variable. Respondents were then classified as users or nonusers of home remedies. Twenty-two percent (N=66) of the sample were categorized as users of home remedies and the remaining 78% (N=234) as nonusers of home remedies. Thirty percent (N=50) of the African American respondents used home remedies compared to 12% (N=16) of White American respondents.

African Americans were more likely to be users of home
remedies than were White Americans (Chi-square = 13.3, P <
0.000). Examples of home remedies respondents used to treat
their hypertension included vinegar, garlic cloves and
capsules, aloe vera juice, multiple vitamin therapy. and
various combinations of the above mentioned products.
Respondents used these products in a number of different
ways. For example, vinegar was ingested pure or mixed with
water to thin the blood and it was also used in cooking to
reduce the toxicity or richness of foods such as pork meats
(See Appendix E for description of home remedies used).

Ethnic Differences in Health Perceptions and Hypertension Temporal Orientation

A group of hypotheses (H4a to H4d) predicted ethnic
group differences on the health perception variables after
controlling for poverty status. MANOVA results indicated
that the responses of hypertensives in the two ethnic groups
were significantly different on costs of Rx (Wilk's
Criterion F = 2.60, p < 0.05), but not on severity (Wilk's
Criterion F = 0.07, p = 0.98) and costs of HR (Wilk's
Criterion F = 0.58, p = 0.63). Table 5-5 lists the results
of the ANOVA group comparisons (Model 1) on the health
perceptions. Statistically significant differences were
found on two dimensions of costs of Rx: forgetting (F =
4.93, p < 0.05) and side effects (F = 7.22, p < 0.01). In
each case, controlling for poverty status, African Americans

reported a higher burden of costs of Rx as compared to Whites. Therefore, hypothesis H4c was partially supported in terms of the costs of Rx. There were no significant differences on any of the other perception variables and thus no support for the other hypotheses (H4a, H4b, and H4d) involving ethnic group differences on health perceptions.

Table 5-5

Least Square Mean Scores on Health Perceptions by Ethnicity Controlling for Poverty Status (Model 1), Age and Education (Model 2)

Perception Variable	Ethnicity			
	Black Model 1	White Model 1	Black Model 2	White Model 2
Severity				
Seriousness	1.15	1.16	1.15	1.20
Fear	2.69	2.73	2.69	2.75
Limitations	3.54	3.63	3.58	3.68
Susceptibility	3.98	3.62	3.97	3.58
Benefits of Rx	4.65	4.56	4.75	4.72
Costs of Rx				
Financial	2.98	3.18	3.03	3.25
Forgetting	4.18*	4.52*	4.21**	4.57**
Refills	4.46	4.61	4.44	4.58
Side Effects	4.25*	4.65*	4.28**	4.70**
Benefits of HR	5.43	5.77	5.62	6.05
Costs of HR				
Lack MD acceptance	2.19	2.17	2.16	2.14
Lack MD discussion	3.87	3.75	3.92	3.83
Lack Efficacy vs Rx	2.25	2.37	2.20	2.31

* $p < 0.05$, ** $p < 0.025$

Note: Independent variables in Model 1 include ethnicity and poverty status and Model 2 includes ethnicity, poverty status, age and education.

It seemed plausible that other demographic variables such as age and education could have some influences on ethnic group variations in health perceptions. In order to test the validity of ethnic group differences across these additional demographic variables, age and education were entered as covariates into the ANOVA models. The analysis of covariance (ANCOVA) (Model 2) revealed results similar to that of the ANOVA models. Statistically significant ethnic group differences were found on the same two dimensions of costs of Rx: forgetting ($F = 5.25$, $p < 0.025$) and side effects ($F = 7.53$, $p < 0.01$). Interestingly, the associations were almost identical or even stronger after partialling out the effects of age and education.

Hypotheses 7a and 7b delineated predicted relationships between ethnicity, poverty status and hypertension temporal orientation. Recall that an individual's·temporal perspective was context dependent. That is, any one individual could be more or less future or present oriented depending upon which aspect of hypertension was in question. This implied that individuals.may not be either totally present or totally future oriented when it came to hypertension. MANOVA results indicated that the responses of African Americans and White Americans on the three temporal orientation domains were significantly different (Wilk's Criterion $F = 4.41$, $p < 0.01$). Hypothesis 7a predicted that African American respondents would be more

present oriented than White American respondents with respect to the experiential aspects of hypertension and its management. As shown in Table 5-6, the ANOVAs (Model 1) of the two experiential domains of hypertension temporal orientation revealed significant differences ($F = 11.78$, $p < 0.001$) on the experiential treatment domain. Partially supporting Hypothesis 7a, controlling for poverty status, African Americans held a more present oriented perspective than White Americans when considering the experiential aspect of treating hypertension. That is, African Americans tended not to fully appreciate the anticipated benefits of treating hypertension when considering their everyday experiences with trying to manage it. There were no significant ethnic group differences in temporal orientation on the experiential disease domain of hypertension.

Hypothesis 7b predicted that there would be no ethnic group differences on the nonexperiential domain of hypertension. This hypothesis was supported such that, controlling for poverty status, African Americans and White Americans did not significantly differ ($F = 0.02$, $p = 0.89$) in temporal orientation when considering issues that they had not yet experienced (See Table 5-6, Model 1). Because temporal orientation is something learned through life experiences, it makes sense that no ethnic group differences were found involving issues that respondents had not yet experienced. Again, in Model 2, age and education were

entered as covariates and similar results were found.
Compared to White Americans, African Americans were more
present oriented on the experiential treatment domain (F =
13.45, p < 0.001) and there were no differences (F = 0.00, p
= 0.95) on the nonexperiential domain of hypertension.

Table 5-6
Mean Hypertension Temporal Orientation Scores by Ethnicity
Controlling for Poverty Status (Model 1), Age and Education
(Model 2)

Domain	Ethnicity			
	Black Model 1	White Model 1	Black Model 2	White Model 2
Nonexperiential	1.32	1.33	1.32	1.32
Experiential Disease	3.08	3.11	2.95	2.88
Experiential Treatment	1.90[*]	1.51[*]	1.86[**]	1.43[**]

* p < 0.001, ** p < 0.0001

Note: Independent variables in Model 1 include ethnicity and
poverty status and Model 2 includes ethnicity, poverty
status, age and education.

Hypertension Temporal Orientation and Health Perceptions

Another group of hypotheses (H5, H6a, and H6b) depicted
the postulated relationships among temporal orientation and
health perceptions. These hypothesized relationships of
temporal orientation and perceptions were tested across all
three domains of hypertension. The regression models
revealed a number of significant relationships between
temporal perspective and perceptions that supported H5 and

partially supported H6a and H6b. Results of the regression
analyses are reported in Table 5-7.

Table 5-7
Regression Analyses of Health Perceptions Across
Hypertension Temporal Orientation Domains

Perception Variables	Domain 1 ßeta (p)	Domain 2 ßeta (p)	Domain 3 ßeta (p)
Susceptibility	0.50 (.03)*	0.18 (.06)	0.35 (.01)*
Benefits of Rx	1.60 (.00)*	0.05 (.63)	0.54 (.00)*
Costs of Rx			
Financial	-0.16 (.37)	-0.07 (.38)	-0.08 (.42)
Forgetting	-0.42 (.00)*	0.11 (.05)*	-0.04 (.63)
Refills	-0.48 (.00)*	0.06 (.18)	-0.13 (.04)*
Side Effects	-0.25 (.05)*	-0.04 (.49)	-0.38 (.00)*
Benefits of HR	-0.33 (.22)	-0.30 (.01)*	-0.76 (.00)*
Costs of HR			
Lack MD acceptance	0.16 (.26)	-0.06 (.39)	0.06 (.44)
Lack MD discussion	-0.04 (.77)	-0.01 (.80)	0.07 (.38)
Lack Efficacy vs Rx	0.40 (.00)*	0.05 (.46)	0.16 (.04)*

* $p \leq 0.05$

Note: Domain 1 = Nonexperiential, Domain 2 = Experiential
Disease, Domain 3 = Experiential Treatment

Hypothesis 5 indicated that more present oriented individuals would feel less susceptible to hypertension consequences than would individuals holding a more future perspective. In line with hypothesis 5, respondents who were more present oriented on the nonexperiential domain (t = 2.24, p < 0.05) and the experiential treatment domain (t = 2.73, p < 0.01) felt significantly less susceptible to hypertension consequences than did those who were more future oriented. Although this relationship was not significant (p = 0.06) on the experiential disease domain, it was in the hypothesized direction.

Next, it was predicted that, compared to more present oriented people, individuals with more future orientations would give greater weight to the temporally distant benefits of prescription medication and home remedies (H6a) and perceive a lesser burden of presently salient costs of prescription medication and home remedies (H6b). Partially supporting H6a, those with more future perspectives on the nonexperiential domain (t = 8.14, p < 0.001) and the experiential treatment domain (t = 4.46, p < 0.001) believed more in the benefits of prescription medication. There were no significant differences in benefits of prescription medication on the experiential disease domain. Contrary to expectations, individuals with more future orientations on the experiential disease domain (t = 2.54, p < 0.01) and the experiential treatment domain (t = 5.13, p < 0.001) believed

less in the benefits of home remedies. Perhaps respondents who were familiar with home remedies had judged them to be less than helpful in avoiding potential adverse outcomes associated with hypertension. This supposition is strengthened by the result that there were no significant differences in benefits of home remedies on the nonexperiential domain, that is, on issues that were less familiar to the respondents.

Hypothesis 6b was also partially supported in terms of costs of prescription medication. Those with future orientations on the nonexperiential domain and the experiential treatment domain tended to believe that costs associated with prescription medication were less problematic than perceived by those with more present orientations. On the nonexperiential domain, three aspects of costs of Rx were significant: forgetting to take the medication ($t = 3.30$, $p < 0.01$), problems with getting refills ($t = 4.78$, $p < 0.001$), and side effects of the medication ($t = 1.95$, $p = 0.05$). On the experiential treatment domain, two aspects of costs of Rx were significant: problems with getting refills ($t = 2.12$, $p < 0.05$), and side effects of the medication ($t = 5.49$, $p < 0.001$). Hypothesis 6b was not supported concerning the experiential disease domain. In fact, the results, albeit barely significant, were the opposite of that which was hypothesized. Respondents who were more future oriented on

the experiential disease domain perceived forgetting to take their medication (t = 1.96, p = 0.05) as more problematic compared to those with present orientations. It is interesting to note that forgetting was the only cost of Rx item that was directly tied to the person as opposed to the medication.

Although hypothesis 6b was not supported in terms of the costs of home remedies, significant relationships were found opposite the hypothesized directions. One aspect of costs of HR, lack of efficacy of HR compared to Rx, was significant. Individuals with more future orientations on the nonexperiential domain and the experiential treatment domain perceived the lack of efficacy of HR compared to · prescription medication (t = 2.94, p < 0.01 and t = 2.05, p < 0.05, respectively) to be more costly compared to the perceptions of those with present orientations. Interestingly, similar results were found across these same two domains of hypertension when the benefits of Rx were considered.

Another analytical approach was also taken to further explore the relationships between temporal orientation and health perceptions. Individuals were clustered into temporal orientation groups that reflected their orientation across all three domains of hypertension temporal orientation. An individual was classified as future oriented on a particular domain if her mean score was ≤ 3

and present oriented if her mean score was > 3. This
dichotomy was not believed to bias the results since only
1%, 7% and 3% of the sample had mean scores of 3 on the
first, second, and third domains, respectively. For
example, individuals who had mean scores ≤ 3 on each of the
three domains were classified as FFF, that is, future
oriented across all three domains. This classification
scheme resulted in eight possible combinations as shown in
Table 5-8. As can be seen, 98% of the sample were
categorized into 4 combinations: FFF (N=162), FPF (N=109),
FPP (N=17), FFP (N=7) and the remaining 2% (N=5) were spread
among three other categories. Because such small numbers of
people were in the other three groups, only the 4 primary
groups (FFF, FPF, FPP, FFP) were included in the inferential
analyses.

Table 5-8
Temporal Orientation Groups Overall and By Ethnicity

Group	Overall (N=300) Freq (%)	Black (N=167) Freq(%)	White (N=133) Freq (%)
FFF	162 (54)	86 (51.5)	76 (57.1)
FFP	7 (2.3)	6 (3.6)	1 (0.8)
FPF	109 (36.3)	57 (34.1)	52 (39.1)
FPP	17 (5.7)	15 (9)	2 (1.5)
PFF	1 (0.3)	1 (0.6)	0 (0)
PPF	3 (1)	2 (1.2)	1 (0.8)
PPP	1 (0.3)	0 (0)	1 (0.8)
PFP	0 (0)	---	---

Note: F = future, P = present, Freq = frequency.

Table 5-9
Least Square Means of Temporal Orientation Groups on Health
Perceptions

Perception Variables	Temporal Orientation Groups			
	FFP	FPP	FPF	FFF
Severity				
Seriousness[§]	1.00	1.29	1.29	1.18
Fear[§]	1.71	2.59	3.15	2.91
Limitations[§]	4.14	3.47	3.72	3.67
Susceptibility	4.14	4.65	4.13	3.71
Benefits of Rx	6.57	5.65	4.05	4.34
Costs of Rx				
Financial[§]	2.86	3.00	3.49	3.53
Forgetting[§]	4.57	4.53	4.37	4.26
Refills	3.71	4.24	4.74	4.57
Side Effects	2.71	3.82	4.47	4.54
Benefits of HR	3.86	4.71	5.99	6.46
Costs of HR				
Lack MD acceptance[§]	2.83	2.31	2.12	2.24
Lack MD discussion[§]	4.86	3.71	3.89	3.94
Lack Efficacy vs Rx[§]	2.50	2.65	2.23	2.23

§ indicates perception variable in which no significant
group differences were found.

Table 5-9 lists the least square means of the health

perceptions for the four temporal orientation groups.

Several temporal orientation group contrasts were conducted

to test the validity of the study hypotheses involving

hypertension temporal orientation and health perceptions.

Results of the MANOVA analyses of the perceptions containing

single item measures indicated that the responses of the

temporal orientation groups were significantly different on

costs of Rx (Wilk's Criterion $F = 3.20$, $p < 0.001$) but not on severity (Wilk's Criterion $F = 1.22$, $p = 0.28$) and costs of HR (Wilk's Criterion $F = 0.68$, $p = 0.73$). Hypothesis 5 was not supported in terms of statistical significance although the relationship was in the predicted direction. The FPP group felt less susceptible to hypertension consequences than did the FFF group ($F = 3.26$, $p = 0.07$). Given an approximate one unit difference in the means for these groups, it seems apparent that this was a clinically important difference. However, the failure to reach statistical significance was probably due to low power that resulted from the relatively small number in the FPP group. Partially supporting H6a and H6b, the FPP group perceived prescription (Rx) medication to be less beneficial ($F = 7.50$, $p < 0.01$) and the costs of Rx (side effects) to be more problematic ($F = 6.16$, $p < 0.015$) than the FFF group. Contrary to H6a, group FPP rated the benefits of HR higher ($F = 8.18$, $p < 0.01$) than the FFF group.

Next, groups FFP and FPF were compared on the health perceptions. Group FFP believed less in the benefits of Rx ($F = 11.96$, $p < 0.001$), perceived a higher burden of the costs of Rx refills ($F = 7.65$, $p < 0.01$) and Rx side effects ($F = 15.71$, $p = 0.0001$), believed more in the benefits of HR ($F = 5.20$, $p < 0.025$) compared to the perceptions of the FPF group. Again, these results support H6a and H6b in terms of

benefits and costs of Rx and are opposite the hypothesized directions regarding the benefits of HR.

There were no differences in the health perception variables when groups differed only on the experiential disease domain. Therefore, groups were pooled together according to their orientation on the experiential treatment domain. This resulted in the pooling of groups FFP and FPP to comprise the present oriented treatment group and of groups FPF and FFF to make up the future oriented treatment group. The present oriented treatment group believed less in the benefits of Rx ($F = 19.30$, $p = 0.0001$), perceived a higher burden of the costs of Rx refills ($F = 9.47$, $p < 0.01$) and Rx side effects ($F = 21.86$, $p = 0.0001$), and believed more in the benefits of HR ($F = 12.08$, $p < 0.001$) than future oriented treatment group. Similar to the above findings, hypotheses 6a and 6b were supported in terms of benefits and costs of Rx and not supported regarding the benefits of HR. An evaluation summary of H5, H6a and H6b are described below.

Summary evaluation of hypothesis 5. More present oriented individuals tended to believe they were less susceptible to hypertension consequences than perceived by those with more future perspectives. This belief was consistent across all three domains of hypertension temporal orientation in the regression analyses (See Table 5-7). Moreover, when people were clustered into temporal

orientation groups, those groups with present orientations
on at least one of two experiential domains also believed
less in their susceptibility (See Table 5-9). However, it
was only when individuals held a present orientation on both
experiential domains of hypertension (FPP group) that this
relationship approached statistical significance (p = 0.07)
in spite of its low power.

Summary evaluation of hypothesis 6a. This hypothesis
was constantly supported in terms of the benefits of
prescription medication. Compared to more present oriented
individuals, those with more future orientations tended to
believe more in the benefits of Rx (See Table 5-7). In
addition, temporal orientation groups that held present
orientations on the experiential treatment domain of
hypertension (FFP and FPP groups) believed significantly
less in the benefits of Rx (See Table 5-9). Regarding the
benefits of home remedies, results were consistently
opposite the hypothesized direction. Individuals with more
future orientations believed less in the benefits of HR
compared to those with more present orientations (See Table
5-7). Temporal orientation groups with a present
orientation on at least one of the experiential domains
(FFP, FPP, and FPF groups) believed more in the benefits of
HR (See Table 5-9). However, in terms of statistical
significance, the relationships between temporal orientation
and benefits of Rx and HR were primarily driven by

differential orientations on the experiential treatment domain of hypertension.

Summary evaluation of hypothesis 4b. This hypothesis was also supported in terms of the costs of prescription medication. Those with more future orientations on both the nonexperiential and experiential treatment domains perceived that the costs of Rx were less problematic than believed by those with a more present orientation See Table 5-7). However, a future orientation on the experiential domain was associated with beliefs that one cost of Rx, forgetting, was more burdensome as compared to beliefs by those holding a more present orientation. Concerning the temporal orientation groups, a present orientation on at least one of the experiential domains (FFP, FPP, FFF groups) was consistently associated with perceptions about costs of Rx (refills and side effects) being more problematic (See Table 5-9). Again, in the case of one costs of Rx, forgetting, the trend was opposite albeit not significantly different in any temporal orientation group comparisons. Again, in terms of statistical significance, it seems apparent that the relationship between temporal orientation and costs of Rx were primarily influenced by differential orientations on the experiential treatment domain of hypertension.

Health Perceptions and Drug Use Behavior

Separate multivariate logistic regression analyses were conducted on compliance with Rx and use of HR. The findings below include descriptions of the tests of several research hypotheses involving the health perceptions and drug use behavior (H1 to H3b and H8) and descriptions of the most parsimonious models in explaining drug use behavior.

Compliance with Rx

In a multiple logistic regression model containing all perception variables (Table 5-10), compliance was associated with financial costs of Rx (adjusted OR = 1.24, 95% CI = 1.00, 1.54, p = .05), forgetting to take Rx (adjusted OR = 1.32, 95% CI = 1.01, 1.73, p < .05), side effects from Rx (adjusted OR = 1.43, 95% CI = 1.11, 1.85, p < .01) and benefits of HR (adjusted OR = 1.18, 95% CI 1.01, 1.38, p < .05). Severity, susceptibility, benefits of Rx, and costs of HR were not significantly associated with compliance with Rx.

Recall that a lower mean score on the health perceptions indicated a stronger belief on that dimension. Supporting H2a (Table 5-10), indicated by positive coefficients, lower perceived costs of Rx significantly increased the probability of compliance. For example, controlling for all other health perceptions, a one unit decrease in perceiving side effects as problematic increased

the odds of compliance by a factor of 1.43. Hypothesis 2a

was not supported in terms of the benefits of Rx but the

relationship was in the hypothesized direction.

Table 5-10
Multivariate Associations of Health Perceptions with
Compliance with Antihypertensive Medication (Rx) (N=241)

Perception Variable	Coefficient	OR	95% CI	p-value
Severity				
Seriousness	-.75	.47	.17, 1.25	.13
Fear	-.05	.96	.75, 1.21	.71
Limitations	.22	1.24	.99, 1.56	.07
Susceptibility	.18	1.20	.99, 1.44	.06
Benefits of Rx	-.01	.99	.83, 1.18	.93
Costs of Rx				
Financial	.22	1.24	1.00, 1.54	.05*
Forgetting	.28	1.32	1.01, 1.73	.04*
Refills	.20	1.22	.87, 1.71	.24
Side Effects	.36	1.43	1.11, 1.85	.01*
Benefits of HR	.17	1.18	1.01, 1.38	.04*
Costs of HR				
Lack MD acceptance	-.20	.82	.62, 1.09	.17
Lack MD discussion	-.40	.96	.71, 1.30	.80
Lack Efficacy vs Rx	N/A			

* p < 0.05

Note: OR = odds ratio, CI = confidence interval

Hypothesis 3b was partially supported in terms of the benefits of HR (Table 5-10). Every one unit increase in the perceived benefits of HR decreased the odds of compliance by a factor 1.18. The mean scores of benefits of HR were 6.43 and 5.28 for the compliant and noncompliant groups, respectively. Hypothesis 3b was not supported regarding the costs of HR although the relationships were in the expected directions.

Although the tests of H1 were not statistically significant, the directions of these relationships are worth noting (See Table 5-10). As expected, lower perceived severity in terms of seriousness and fear were associated with a greater likelihood of compliance. However, contrary to H1, lower beliefs about the limitation component of severity and lower susceptibility beliefs were associated with higher probabilities of compliance.

Next, a stepwise logistic regression of the health perception variables was conducted to obtain a simpler and more parsimonious model that would increase the power of subsequent analyses and hypothesis testing. Moreover, this procedure allowed each perception variable to compete for entry and not be constrained by the theory driven entry that was employed in the previous multivariate modeling.

Table 5-11
Multivariate Logistic Regression of Compliance with
Antihypertensive Medication (Rx) (N=241)

Predictors	Coefficient	OR	95% CI	p-value
Costs of Rx				
Forgetting	.34	1.41	1.08, 1.84	.01*
Refills	.26	1.30	.94, 1.80	.11
Side Effects	.36	1.43	1.11, 1.84	.01*
Benefits of HR	.20	1.22	1.03, 1.43	.02*
Poverty Status				
Below				
Within threshold	-.42	.66	.22, 1.98	.46
Above	.73	2.07	.84, 5.08	.12
Education	-.09	.92	.85, 1.01	.07
Gender	-.70	.50	.24, 1.04	.06
Age	.03	1.03	1.00, 1.06	.05*

* $p < 0.05$

Note: The within threshold poverty status represents the comparison of the second level to the first level and above represents the comparison of the third level to the first level.

This procedure resulted in the health perceptions of forgetting, refills, side effects, and benefits of HR being significantly associated with compliance (See Table 5-11). The only difference between this model and the previous multivariate model was that refills dimension of costs of Rx (adjusted OR = 1.37, 95% CI = 1.02, 1.85, $p < .05$) entered the model and the financial aspect of costs of Rx dropped out. An interactive scoretest examination of each perception variable confirmed that the reduced model

contained the "best" set of perception variables in terms of explanatory power. That is, each variable was tested for re-entry into the model based upon the significance of its scoretest value and none were found to significantly reduce the deviance (unexplained variance) in compliance with Rx.

Third, the modifying factors were tested for entry into the model containing the health perceptions. Supporting H8, the addition of the modifying factors into the model did not yield any significant main effects of ethnicity, poverty status, or hypertension temporal orientation (See Table 5-12).

With regard to the research question of determining the adequacy of the proposed model in explaining compliance with Rx, additional demographic variables that have been found to influence compliance were tested for model entry (Table 5-12). They included age, gender, education, length of having hypertension, and geographic residence. Of these, only age was significantly related to compliance whereby every one year increase in age increased the odds of being compliant by a factor of 1.03 (p = 0.01). The mean ages of the compliant and noncompliant groups were 60.5 and 57.1 years, respectively. Again an analysis was undertaken of the scoretest values of variables that did not enter the model, and, although there were no main effects of poverty status, education and gender, the constellation of these three variables had a significant scoretest value of 10.56 (df =

4, p = .032). This was an indication that the inclusion of this constellation of variables significantly reduced the deviance of the model and thus provided a better fit than the model containing only the perceptions and age.

Table 5-12
Scoretests of Modifying Factors and Demographic Variables for Entrance in Multivariate Logistic Regression Model of Compliance with Antihypertensive Medication (Rx) (N=241)

Variables	Beta Step	Scoretest	df	p-value
Ethnicity	-.31	.81	1	.37
Poverty Status				
Below		1.49	2	.48
Within Threshold	-.57	1.28	1	.26
Above	.33	.89	1	.35
Temporal Orientation				
Nonexperiential	-.37	1.61	1	.20
Experiential Disease	-.06	.20	1	.65
Experiential Treatment	-.16	.81	1	.37
Age	-.03	4.04	1	.04*
Gender	-.68	3.55	1	.06
Geographic Residence	-.15	.15	1	.71
Education	-.06	2.12	1	.15
1st Diagnosis	-.01	.16	1	.69

* p < 0.05

In a multiple logistic regression model including this constellation of variables (See Table 5-11), the odds ratios slightly changed (adjusted OR for forgetting = 1.41, 95% CI = 1.08, 1.84, p < .01; adjusted OR for refills = 1.30, 95%

CI = .94, 1.80, p = .11; adjusted OR for side effects = 1.43, 95% CI = 1.11, 1.84, p < .01; adjusted OR for benefits of HR = 1.22, 95% CI 1.03, 1.43, p < .02; adjusted OR for age = 1.03, 95% CI = 1.00, 1.06, p = .05).

Use of HR

In a multiple logistic regression model containing all health perception variables (Table 5-13), use of HR was associated with seriousness of hypertension (adjusted OR = 2.83, 95% CI = 1.05, 7.62, p < .05), fear of having hypertension (adjusted OR = 0.69, 95% CI = 0.53, 0.90, p < .01), benefits of HR (adjusted OR = 0.68, 95% CI = 0.57, 0.81, p < .001), and lack of physician's acceptance of HR (adjusted OR = 1.36, 95% CI = 0.78, 1.45, p < .05). The limitation aspect of severity, susceptibility, benefits of Rx, and costs of Rx were not associated with use of HR (See Table 5-13).

Supporting H1 (Table 5-13), every one unit decrease in the fear component of hypertension decreased the odds of using HR by a factor of 0.69. Contrary to H1, those who did not strongly believe that hypertension was a serious disease were 2.8 times more likely to use HR compared to those who did strongly believe hypertension was serious. Hypothesis 1 was also not supported in terms of susceptibility, however, the relationship was in the expected direction.

Table 5-13
Multivariate Associations of Health Perceptions with Use of
Home Remedies (HR) (N=241)

Perception Variable	Coefficient	OR	95% CI	p-value
Severity				
Seriousness	1.04	2.83	1.05, 7.62	.04*
Fear	-.37	.69	.53, .90	.01*
Limitations	.03	1.03	.80, 1.31	.84
Susceptibility	.03	1.03	.87, 1.23	.72
Benefits of Rx	.07	1.08	.90, 1.29	.42
Costs of Rx				
Financial	-.04	.96	.76, 1.20	.71
Forgetting	-.25	.78	.58, 1.04	.09
Refills	-.15	.86	.60, 1.22	.40
Side Effects	-.02	.98	.75, 1.29	.88
Benefits of HR	-.39	.68	.57, .81	.00*
Costs of HR				
Lack MD acceptance	.31	1.36	1.02, 1.83	.04*
Lack MD discussion	.06	1.06	.78, 1.45	.70

* p < 0.05

Note: OR = odds ratio, CI = confidence interval

Hypothesis 2b (Table 5-13) was supported such that every one unit decrease in the benefits of HR decreased the odds of using HR by a factor of 0.68. Also supporting H2b, every one unit decrease in perceived lack of physicians' acceptance of HR increased the odds of using HR by a factor of 1.36.

Not supporting H3a statistically (Table 5-13), the benefits and costs of Rx were not significantly related to use of HR. However, there was directional support for H3a.

Like the compliance model, the next step involved a stepwise logistic regression of the health perceptions (Table 5-14). This procedure yielded a model containing seriousness, fear, forgetting, benefits of HR, and lack of physicians' acceptance of HR as predictor variables. Compared to the previous model containing all perception variables, the reduced model contained one additional significant variable, the forgetting dimension of costs of Rx (adjusted OR = 0.76, 95% CI = 0.58, 0.98, p < .05). Scoretest analyses on the remaining health perceptions also supported the validity of the reduced model, indicating that none of the remaining health perceptions significantly lowered the deviance of the reduced model.

Next, the modifying factors were tested for entry into the perceptions model (Table 5-15). Contrary to H8, the addition of the modifying factors in the model yielded a significant main effect of ethnicity whereby African

Table 5-14
Multivariate Logistic Regression of Use of Home Remedies
(HR) (N=241)

Predictors	Coefficient	OR	95% CI	p-value
Severity				
Seriousness	1.16	3.20	1.04, 9.82	.04*
Fear	-.33	.72	.54, .94	.02*
Costs of Rx				
Forgetting	-.24	.79	.59, 1.06	.11
Benefits of HR	-.45	.64	.53, .78	.00*
Costs of HR				
Lack MD Acceptance	.42	1.53	1.13, 2.08	.01*
Ethnicity	.98	2.67	1.15, 6.21	.02*
Poverty Status				
Below				
Within threshold	5.23	186.5	4.08, 8529	.00*
Above	.55	1.74	.10, 31.65	.71
Education	.22	1.24	1.03, 1.50	.03*
Poverty 2 * Education	-.41	.66	.47, .93	.02*
Poverty 3 * Education	-.08	.92	.73, 1.16	.48

* $p < 0.05$

Note: The within threshold poverty status represents the
comparison of the second level to the first level and above
represents the comparison of the third level to the first
level.

The poverty 2 * education variable represents the
interaction between the second level of poverty and
education and poverty 3 * education variable represents the
interaction between the third level of poverty and
education.

Americans were 3.3 times more likely to be users of HR

compared to White Americans (95% CI = 1.49, 7.20, p = .003).

It is important to note, however, that this estimate did not

reflect influences of known covariates such as poverty

status.

Table 5-15

Scoretests of Modifying Factors and Demographic Variables
for Entrance in Multivariate Logistic Regression Model of
Use of Home Remedies (HR) (N=241)

Variables	Beta Step	Scoretest	df	p-value
Ethnicity	1.11	9.29	1	.00[*]
Poverty Status				
Below		4.05	2	.13
Within Threshold	1.04	4.04	1	.05
Above	-.37	1.04	1	.31
Temporal Orientation				
Nonexperiential	.25	.49	1	.49
Experiential Disease	-.25	2.93	1	.11
Experiential Treatment	.02	.01	1	.93
Age	.02	2.40	1	.12
Gender	-.21	.23	1	.63
Geographic Residence	.50	1.09	1	.30
Education	.08	3.97	1	.05
1st Diagnosis	-.03	2.68	1	.10

* p < 0.05

   In testing the model's adequacy in explaining use of

HR, again covariates such as age, gender, education, length

of having hypertension, and geographic residence were

allowed to enter the model. None were significantly related to use of home remedies (Table 5-15). However, scoretest analyses revealed that, as a group, the poverty status, education, and poverty status by education interaction variables significantly improved the model's fit (Scoretest = 18.30, df = 5, p = .003). In a multivariate logistic regression containing this group of covariates (Table 5-14), two key things happened. First, after controlling for all other variables in the model including poverty status and education, African Americans were 2.67 times more likely to be users of HR compared to White Americans. Second, there was a significant poverty status by education interaction whereby the relationship between poverty status and use of HR was significant only for those respondents with less than a high school education (Chi-square = 8.48, p = .01). The odds ratios of the perception variables remained relatively the same (See Tables 13 and 14.

CHAPTER 6
DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

In this chapter, the study findings are discussed in terms of the major goal of this research: to assess drug use behavior among African American and White American hypertensive patients within the context of health and illness perceptions and their subsequent effect on drug use practices, using the Health Belief Model (HBM) as the theoretical framework. First, a discussion of the influences of culture, as manifested in ethnicity and hypertension temporal orientation, on health perceptions of hypertensive individuals is presented. Second, the effects of health perceptions on the use of both prescribed antihypertensive medication (Rx) and home remedies (HR) are discussed. Recommendations for future research are presented in the discussion of study findings. Next, the limitations of the study are addressed. Finally, the conclusions of the study are presented and implications for medical and pharmacy practice are offered.

The Health Belief Model (HBM) and Drug Use Behavior

Much research using the HBM has examined the effects of HBM variables on compliance with prescribed medication

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regimens (DiMatteo and DiNicola, 1982). However, there has
been little empirical work and no known studies using the
HBM that examined individual perceptions and their effects
on use of alternative treatments such as home remedies
(Harwood, 1981). Although literature describing the origin
of the HBM acknowledges that individuals choose alternatives
they deem most beneficial relative to other known
alternatives (Becker, 1974), little is known about how the
appraisal of one treatment alternative affects the use of
another. In addition, many of the HBM studies on compliance
have failed to investigate the role of cultural variables in
the formation and structure of the HBM perception variables.
The results of this study indicate that culture, as
reflected in ethnicity and hypertension temporal
orientation, does affect health perceptions and that these
culturally-related health perceptions jointly influence both
compliance with Rx and use of HR.

Ethnicity, Hypertension Temporal Orientation and Health Perceptions

In their review of sociological, anthropological, and
psychological health-related literature, Landrine and
Klonoff (1992) emphasized the importance of including the
cultural context in studies examining health beliefs and
schemas. Moreover, they asserted that neglected cultural
differences in health beliefs and behaviors among study
participants may have contributed to the negligible and

inconsistent findings across studies examining ethnic differences in health behaviors. In analyses such as those described in their review, ethnicity is treated as a biological rather than a social and cultural variable. In essence, ethnicity should be viewed as a part of culture and not as an absolute representation of culture. Therefore, it was not surprising that, taken by itself, the direct relationships between ethnicity and health perceptions in this study were not particularly enlightening.

A set of hypotheses (H4a to H4b) predicted ethnic group differences in health perceptions. It was predicted that, controlling for poverty status, African Americans would have higher severity beliefs (H4a), lower susceptibility beliefs (H4b), higher perceived benefits of HR and costs of Rx (H4c) and lower perceived benefits of Rx and costs of HR (H4d) as compared to White Americans. No support was found for H4a, H4b or H4d. However, partially supporting H4c, after controlling for selected covariates (poverty status, age, and education), significant ethnic group differences were found on only two costs of Rx variables, forgetting and side effects and, in both cases, African Americans reported a higher burden of costs than did White Americans.

According to a 1985 report of the Secretary's Task Force on Black and Minority Health (Department of Health and Human Services, 1985), compared to White Americans, the perceptions about severity of hypertension were rated higher

among African Americans. However, African Americans and White Americans had similar perceptions of severity in this study as indicated by the lack of support for hypothesis 4a. Nevertheless, when considering the discussion below involving significant ethnic group differences in temporal orientation and its impact on health perceptions, the results imply that ethnicity had an indirect effect on health perceptions through its direct influence on hypertension temporal orientation. The influences of ethnicity on health perceptions cannot be fully appreciated without the attendant cultural component of temporal orientation.

Temporal orientation, an aspect of culture, permeates the thoughts, feelings and behaviors of individuals (Graham, 1981). So much so, some believe that time is not a part of culture, but that time is culture (Hall, 1983). The way individuals approach and react to situations, including medical situations, is directly related to their temporal perspective regarding that particular context (Goodenough, 1981). Thus, temporal orientation regarding hypertension influences the formation of individual belief systems regarding hypertension and its management. In this study, hypertension temporal orientation is thought to play a mediating role between ethnicity and health perceptions. That is, ethnicity indirectly influences health perceptions through its relationship with hypertension temporal

orientation. When health perceptions were evaluated within
the cultural context of hypertension temporal orientation,
the study findings were both informative and quite
intriguing.

The factor analysis revealed that hypertension temporal
orientation could be represented by three factors.
Apparently, respondents' cognitive representations of
hypertension and its management comprised three domains: (1)
nonexperiential; (2) experiential disease; and (3)
experiential treatment. The nonexperiential domain
represented issues that are potential consequences of both
hypertension and its management. The experiential disease
domain involved the day-to-day dealing with hypertension.
The experiential treatment domain involved issues related to
the day-to-day management of hypertension. It is believed
that familiarity served as the underlying theme of this
three factor model of hypertension temporal orientation
since respondents seemed to have more refined cognitions
about issues in which they were most familiar or had already
experienced (experiential disease and treatment). Because
culture is learned patterns of thought and behavior, it was
anticipated that the two ethnic groups would differ on the
experiential domains of hypertension (H7a) but not on the
nonexperiential domain (H7b). As expected, African
Americans and White Americans did not significantly differ
on the nonexperiential domain of hypertension. However,

when considering the daily management of hypertension (experiential treatment domain), African Americans were more present oriented than were White Americans, partially supporting H7a. This finding is consistent with the positions of a number of authors who argue that a present orientation is part of the African American experience (Houston, 1990; Jones, 1988). For example, Jones (1988) asserted that the routine correlation between effort and outcome has been severed for many African Americans through years of disconfirming evidence about the present behavior-future outcome contingency. As a result, many African Americans have created alternative ways of gaining control over this contingency and, although potentially successful, such improvisation has a tendency to focus on the present (Jones, 1989). The importance of ethnic differences on the experiential treatment domain becomes even more significant when one considers that different temporal orientations on the experiential treatment domain were fundamental in respondents' evaluations of the benefits and costs of the two treatment alternatives.

Hypothesis 5 indicated that, compared to more future oriented respondents, those with more present orientations would see themselves as less susceptible to hypertension consequences. Supporting H5, respondents with more present orientations on the experiential domains tended to believe they were at lower risk of having strokes, heart attacks or

kidney problems resulting from uncontrolled hypertension.
These observations are somewhat difficult to put in context
because of the lack of research involving temporal
orientation and health perceptions. The psychological
literature on time perception indicates that future oriented
people desire to control what happens in the future (Cottle,
1976; Bergadaa', 1990). Perhaps these results reflected
present oriented respondents' feelings about lack of control
over potential consequences of hypertension. Future
research could examine the relationship between temporal
orientation and health locus of control beliefs. To the
extent that susceptibility implies cognitions about the
future, it is possible that those who rely on everyday life
experiences would tend to underestimate the likelihood of
events occurring at some future time. An alternative
explanation could be that respondents who were focused in
the present felt that they were taking the necessary daily
precautions to prevent future problems and thus rightfully
so believed that adverse consequences would be avoided.
That is, there may be a difference in the temporal sequence
of events than that proposed by the HBM whereby treatment
behavior influenced susceptibility beliefs through some type
of feedback loop. Future research could include a
longitudinal study where differences in trends in behavior
and beliefs could be analyzed. Clearly, further research is
needed to better understand the relationship between

temporal orientation, health perceptions and subsequent treatment practices.

Interestingly, the directions of the relationships between temporal orientation and perceived benefits and costs were dependent upon which treatment alternative was being examined.   Temporal orientation group analyses revealed that the relationships between hypertension temporal orientation and the benefits and costs of Rx and HR were primarily a function of differential orientations on the experiential treatment domain of hypertension which represented issues involving the daily management of hypertension.   It makes sense that the evaluation of treatment alternatives would be dependent on an individual's temporal orientation within the experiential treatment context.   For presentation purposes, the following discussion involving hypertension temporal orientation and perceived benefits and costs will focus primarily on the nature of these relationships within the context of an individual's daily experiences involving hypertension management.

Hypothesis 6a predicted that more future oriented individuals would give greater weight to the temporally distant benefits of either Rx or HR as compared to the presently salient costs of either treatment modality. Similarly, hypothesis 6b predicted that more present oriented individuals would give greater weight to the

presently salient costs of either Rx or HR as compared to
the temporally distant benefits of either treatment
modality. Partially supporting H6a and H6b, more future
oriented respondents believed more strongly in the benefits
of Rx and less in the costs of Rx compared to more present
oriented respondents. These findings support extant
temporal orientation research which suggests that future
oriented individuals tend to place much more faith in
obscure future events and to engage more in activities that
promote good health compared to individuals who are oriented
in the present (Bergadaa`, 1990; Harwood, 1981). Therefore,
it is reasonable that the temporally distant benefits of Rx
would tend to outweigh the presently salient costs of Rx for
more future oriented respondents.

The study's findings did not support H6a and H6b in
terms of home remedies. The results indicated that more
future oriented individuals believed less in the benefits of
HR and more in the costs of HR. These relationships were
directionally opposite those found with perceived benefits
and costs of Rx. A possible explanation is that future
oriented people might think of HR as being more costly
because they may believe that HR handles transient symptoms
of hypertension, for example, but not as being very helpful
over the long run. This is supported by the finding that
future oriented people believed less in the benefits of HR.
Another possibility is that present oriented people could

perceive HR as being more beneficial and less costly because they may be using HR to compensate for other things (e.g., diet and exercise) they may not be doing to better manage their hypertension. This assertion is supported by reasons people give for using home remedies (Heurtin-Roberts and Reisin, 1990). Moreover, in their study of individuals with a variety of diseases including hypertension, Kravitz et al. (1993) concluded that even when patients recalled their physicians' advice concerning lifestyle changes (e.g., low-salt diet, regular exercise, and decreased stress), many patients did not include these medical suggestions into their daily lives. The preceding interpretations serve as another indication of the need for more research involving temporal orientation and how it relates to patient beliefs and subsequent engagement in both pharmacological and nonpharmacological hypertension management.

Effects of Health Perceptions on Compliance with Rx and Use of HR

The primary predictors of compliance with Rx were costs of Rx, benefits of HR and age. Partial support was found for H2a which indicated that the benefits and costs of Rx would positively and negatively affect the probability of compliance with Rx, respectively. When respondents perceived forgetting to take Rx and side effects of Rx as problematic, they were less likely to comply with Rx. Similar findings have been reported in HBM studies examining

sick role behaviors (Janz and Becker, 1984; Harrison, Mullen and Green, 1992) where the perceived costs dimension has consistently been predictive of and negatively related to compliance behavior.

When respondents believed that HR were beneficial, they were also less likely to comply with Rx, partially confirming H3b which indicated that perceived benefits of HR would decrease the likelihood of compliance with Rx. This finding is supported in the psychological literature that recognizes that an individual tends to choose the alternative (s)he deems most beneficial relative to other alternatives in the choice set (Lynch, 1984; Jaccard, 1981). In addition, studies have documented that ethnic-minority patients do make concurrent use of both the formal and informal health care systems (Scott, 1981; Bailey, 1987). If indeed respondents are substituting home remedies in place of their antihypertensive medication, this has both medical and pharmacy practice implications for enhanced patient care, which are discussed in a later section.

The results of the multivariate logistic regression model of compliance with Rx revealed that age was a significant predictor of compliance over and above the health perceptions. Older patients were more compliant with Rx. In the literature, the effect of demographic variables on compliance is equivocal. Findings from a number of studies (Kirscht and Rosenstock, 1977; Nelson et al., 1978;

Klein, 1988) indicate that sociodemographic variables are predictive of compliance, however, in his review of compliance literature, Fletcher (1989) found no evidence that compliance rates considerably differed across sociodemographic factors. The present study provides further evidence for the significance of age in the prediction of compliance.

The primary predictors of use of HR were severity, benefits of HR, costs of HR, ethnicity and the poverty by education interaction. Partially supporting H1, when respondents were fearful of hypertension but did not strongly believe in the seriousness of hypertension, they were more likely to use HR. Furthermore, when they believed more in the benefits of HR and believed less in the costs of HR, they were more likely to use HR, confirming hypothesized relationships in H2b. Unlike other HBM studies, the severity and benefits dimensions in this study were powerful predictors of use of HR, and, similar to other HBM studies, the perceived costs dimension was predictive of use of HR (See Janz and Becker, 1984 and Harrison, Mullen and Green, 1992 for reviews of HBM studies). It is important to note, however, that the differential effects of the HBM dimensions on use of HR could be attributed to the nature of the behavior under examination. As was mentioned earlier, effects of HBM variables on use of home remedies are relatively unknown. However, it is believed that since HR

are not usually medically authorized treatments of choice,
an individual may have to rely more on her own expertise and
knowledge in the process of evaluating the treatment
alternatives. Hence, this may explain why different
perceptions become operative when patients elect to use HR.

It was interesting that no support was found for H3a
whereby the perceived benefits and costs of Rx had no
significant impact on whether or not respondents used HR,
especially considering that the benefits of HR was
predictive of compliance with Rx. Evidently, respondents'
evaluations of Rx did not figure into their decisions to use
home remedies. Further research is needed to better
understand how patients decide to engage in alternative
treatment options such as home remedies.

Contrary to the theoretical proposition of the HBM
described in H8, modifying factors (e.g., ethnicity and
poverty status) directly influenced the use of HR even after
the health perceptions were accounted for. There was a
significant main effect of ethnicity and a significant
poverty status by education interaction. African American
respondents were more likely users of HR than were White
American respondents. A possible explanation for the direct
effect of ethnicity is that there are other culturally-
related beliefs, not identified in the model, that are
direct determinants of use of HR. For example,
spirituality, a key component of folk medicine, could have

been the underlying factor that motivated ethnic group differences in use of HR in the present study (Henderson and Primeaux, 1981). This assertion remains speculative, however, since measuring spirituality was beyond the scope of this study.

Compared to people above the poverty threshold, individuals within the poverty threshold were significantly more likely to use HR only if they had less than a high school education. This finding partially reflects evidence in the literature where beliefs about folk medicine seem more prevalent among lower socioeconomic groups (Snow, 1981). However, it is important to note that, in this study, the relationship between poverty status and use of HR only held for respondents who did not finish high school. This finding strengthens an earlier assertion that perhaps people tend to use their own expertise and knowledge, likely a function of education, in the evaluation and consequent use of HR.

Study Limitations

One important limitation of this study was that both response variables, compliance with Rx and use of HR, were both obtained by self-reports. It is believed that the potential bias of self-reports, where patients might overreport their compliance or underreport their use of HR, was minimized by assuring confidentiality and anonymity.

Moreover, the results of the validity assessment of self-reported medication use found in the pretest as well as in other studies (Kravitz et al., 1993) indicate that self-reports are good estimates of actual medication taking practices.

A second primary limitation of the study involves the issue of external validity. The HBM was examined in a sample of primarily older African American and White American hypertensives who resided in the southeastern region of the country and who had not experienced any major complications from uncontrolled hypertension. However, the demographic characteristics of the sample, primarily African American and female, are representative of population demographics of hypertensives (National Institutes of Health, 1993). The results cannot be generalized to hypertensives who have experienced complications from uncontrolled hypertension. For example, people who have had strokes or heart attacks may hold different belief systems than the participants in this study. Nevertheless, it is believed that the nature of the relationships among the constructs in this study can be generalized to other hypertensives.

Despite these limitations, some potentially important findings emerged regarding the effect of culturally-related beliefs and perceptions on drug use behavior of African American and White American hypertensives.

Conclusions

This study demonstrated that individual health belief systems are situated in culture and that these culturally-related beliefs and perceptions guide subsequent treatment practices among African American and White American hypertensives. The findings of this study support the following principal conclusions: (1) ethnicity influences temporal orientation regarding the experiential treatment context of hypertension; (2) hypertension temporal orientation affects individuals' perceptions of disease and evaluations of treatment alternatives; (3) compliance with Rx is affected by individual demographic characteristics as well as beliefs about the costs of Rx and the benefits of HR; and (4) use of HR is a function of individual demographic characteristics, perceptions of disease severity, and evaluations of the benefits and costs of HR.

Implications

This project represented an attempt to broaden our knowledge concerning the role of culture in the treatment decisions of African American and White American hypertensives. Understanding how different illness and treatment beliefs relate to different aspects of drug use behavior may be important in devising strategies to improve patient outcomes in culturally diverse populations. If optimal management is to be achieved, health and medical

care providers should be aware of the cultural system of beliefs that patients bring to the medical encounter.

The study findings suggest that there are two primary categories of information that should be considered when developing interventions and when monitoring patient outcomes: (1) temporal orientation of patients regarding hypertension and its management, and (2) beliefs of patients relevant to their disease and their evaluations of alternative treatments recognized by the patient. Each of these primary elements of information is addressed below.

Hypertension temporal orientation. Ethnic groups did not differ in temporal orientation pertaining to issues they had not yet experienced (nonexperiential) or to daily issues involving the disease of hypertension (experiential disease). The implication to providers is that ethnic-based strategies targeting potential consequences of hypertension or daily issues involving hypertension may not be particularly effective in modifying the belief structures of African American and White American hypertensives who have not suffered major complications of uncontrolled hypertension. However, this study indicated that interventions targeting the daily treatment of hypertension may be more productive and worthwhile among culturally diverse groups.

Recognition of an individual's temporal orientation regarding the treatment of hypertension may be useful in

targeting those patients who may be at risk of not experiencing the intended benefits of medical therapy. In this study, African Americans were significantly more present oriented regarding the daily management of hypertension (experiential treatment) compared to White Americans. However, physicians and pharmacists should be cautioned to not assume that this automatically applies to all patients of African or European descent. Rather, ethnic group membership should serve as a potential indicator and guide to asking ethnically-relevant questions to the patient. The implication is that hypertension temporal orientation affects health beliefs and behavior and health care professionals should seek to obtain the temporal perspective of their patients regarding the treatment of hypertension. Pharmacists, who are in an excellent position to ascertain this information, could talk with patients about their daily management of hypertension. For example, pharmacists, by talking with patients, can find out if patients believe that hypertension is symptomatic and, if so, how they feel about taking medication when they do not believe that their blood pressure is high. This study's results indicate that responses to questions developed in this study would give the pharmacist a good impression of patients' temporal perspective regarding hypertension management. Because the benefits of treating hypertension are focused in the future, intervention and monitoring

strategies should include, for example, pharmacists and physicians helping present oriented patients make the connections between present behaviors (e.g., taking medication or using home remedies) and future outcomes (e.g., avoidance or unavoidance of adverse consequences). It should be kept in mind that temporal orientation is something learned which implies that it can be unlearned.

Patient belief systems. In recognition of the need for culturally-appropriate health and medical care and in appreciation for the diversity in health beliefs and practices of different cultural groups, there has been an explosion of interest in alternative medicine, as evidenced by the recent establishment of the Office of Alternative Medicine within the U.S. National Institutes of Health. Issues involving nontraditional medicine (e.g., home remedies) have received much attention in both the medical and lay literatures. Because we were socialized to believe that effective treatment equals eradication of disease, we may not fully accept, consciously or subconsciously, the concept of chronic disease. As a result, people often engage in the use of informal treatments, often times to supplement formal medical treatment, when trying to manage chronic illnesses such as hypertension. The use of alternative medicines in the treatment of medical conditions cannot be underestimated. For example, in a nationwide telephone survey, Eisenberg and his colleagues (1993)

reported that 11% of the participants with hypertension had used some form of unconventional therapy (including home remedies) to treat their high blood pressure. In the present study, twenty-two percent (66 out of 300) of the respondents used home remedies to treat their hypertension. Hence, obtaining patient beliefs about and evaluations of alternative treatments are paramount to health care providers' ability to evaluate the "total" drug therapies of their clients and to effectively monitor patient outcomes.

This study indicated that age, costs of Rx in terms of forgetting and side effects and benefits of HR are key determinants of compliance with Rx. On the other hand, ethnicity, poverty status, education, severity beliefs and the benefits and costs of HR were primary predictors of use of HR. The implication is that health and medical care providers can help to improve compliance with prescribed regimens by helping patients incorporate the regimens into their daily routines or by changing the medication so that side effects are minimized. In addition, providers should actively and nonjudgmentally elicit patient beliefs about and use of home remedies so that they can be aware of the potential for concurrent use of HR and antihypertensive medication. This is especially important since an estimated 72% of people who use alternative treatments fail to tell their regular physicians they are doing so (Eisenberg et al., 1993).

The findings that benefits of HR negatively affected compliance with Rx and positively affected use of HR provide further evidence for the significance of gathering information on patient beliefs about alternative treatments. These findings are believed to highlight the potential for substitution practices between home remedies and antihypertensive medications. Providers should be mindful of this possibility in the process of evaluating patients' total drug therapies and also when monitoring patient outcomes. It should be kept in mind that conventional medications may not validly represent the patient's total treatment regimen. Physicians, pharmacists and other providers should gather enough patient information so that they can make informed judgments concerning if or to what extent patients may be engaging in treatment activities that are counter to positive therapeutic outcomes.

The strategies reported here are supported by the growing concern for culturally appropriate health and medical care. More research is needed to improve our understanding of the role of culture in health and medical care situations. This study suggested that: (1) ethnicity has an important effect on an individuals approach to and engagement in hypertensive treatment; (2) hypertension temporal orientation shapes perceptions about disease and evaluations of treatment alternatives; (3) evaluations of home remedies (and perhaps other alternative treatments)

affect the use of antihypertensive medications and home
remedies; and (4) a significant number of people
concurrently use antihypertensive medication and home
remedies in the management of hypertension. Research to
augment or replicate this study in other regions of the
country and among other ethnic groups should be encouraged
to evaluate the validity of these findings and also to
provide culturally-based medical recommendations that can be
effective in an increasingly diverse society.

INTERITEM AND ITEM TO TOTAL CORRELATIONS OF PRETEST SCALES

I. INTERITEM AND CORRECTED ITEM TO TOTAL CORRELATIONS OF THE SEVERITY SCALE

	Q1	Q2	Q3	Q4
Q1	1.00			
Q2	0.17	1.00		
Q3	0.44	0.05	1.00	
Q4	0.42	0.43	0.05	1.00
Item to total	0.52	0.30	0.24	0.43

II. INTERITEM AND CORRECTED ITEM TO TOTAL CORRELATIONS OF THE SUSCEPTIBILITY SCALE

	Q8	Q9	Q10	Q11
Q8	1.00			
Q9	0.46	1.00		
Q10	0.22	-0.02	1.00	
Q11	0.39	0.20	0.57	1.00
Item to total	0.50	0.28	0.34	0.55

III. INTERITEM AND CORRECTED ITEM TO TOTAL CORRELATIONS OF THE BENEFITS OF RX SCALE

	Q53	Q54	Q55	Q56
Q53	1.00			
Q54	0	0		
Q55	0.63	0	1.00	
Q56	0.40	0	0.62	1.00
Item to total	0.57	0	0.74	0.57

IV. INTERITEM AND CORRECTED ITEM TO TOTAL CORRELATIONS OF
THE COSTS OF RX SCALE

	Q57	Q58	Q59	Q60	Q61
Q57	1.00				
Q58	0.48	1.00			
Q59	-0.13	0.05	1.00		
Q60	0	0	0	0	
Q61	-0.06	0.48	0.42	0	1.00
Item to total	0.13	0.54	0.15	0	0.43

V. INTERITEM AND CORRECTED ITEM TO TOTAL CORRELATIONS OF THE
BENEFITS OF HR SCALE

	Q62	Q63	Q64	Q65
Q62	1.00			
Q63	0.78	1.00		
Q64	0.20	0.19	1.00	
Q65	0.76	0.54	0.42	1.00
Item to total	0.76	0.63	0.30	0.75

VI. INTERITEM AND CORRECTED ITEM TO TOTAL CORRELATIONS OF
THE COSTS OF HR SCALE

	Q66	Q67	Q68	Q69
Q66	1.00			
Q67	0.14	1.00		
Q68	0.24	0.25	1.00	
Q69	0.36	0.36	0.17	1.00
Item to total	0.28	0.30	0.31	0.45

VII. INTERITEM CORRELATIONS OF THE EXPERIENTIAL DOMAIN OF HYPERTENSION SCALE

	Q14	Q16	Q18	Q20	Q22	Q24	Q26	Q28	Q29
Q14	1.00								
Q16	-.16	1.00							
Q18	0.32	0.23	1.00						
Q20	0.29	0.18	0.93	1.00					
Q22	0	0	0	0	0				
Q24	0.21	0.07	0.44	0.47	0	1.00			
Q26	-.08	-.04	0.00	0.01	0	-.16	1.00		
Q28	0.46	-.09	0.39	0.56	0	0.05	0.28	1.00	
Q29	0	0	0	0	0	0	0	0	0

VIII. INTERITEM CORRELATIONS OF THE NONEXPERIENTIAL DOMAIN OF HYPERTENSION SCALE

	Q15	Q17	Q19	Q21	Q23	Q25	Q27
Q15	1.00						
Q17	1.00	1.00					
Q19	0.84	0.83	1.00				
Q21	-.19	-.19	-.25	1.00			
Q23	0	0	-.22	0.20	1.00		
Q25	0	0	-.09	-.09	0.41	1.00	
Q27	0	0	0	0	0	0	0

Note: Deleted items are underlined.

INTERITEM AND ITEM TO TOTAL CORRELATIONS OF FINAL SCALES

I. INTERITEM AND CORRECTED ITEM TO TOTAL CORRELATIONS OF THE SEVERITY SCALE

	Q1	Q2	Q3
Q1	1.00		
Q2	0.12	1.00	
Q3	0.03	-0.02	1.00
Item to			
total	-0.05	0.07	0.21

II. INTERITEM AND CORRECTED ITEM TO TOTAL CORRELATIONS OF THE SUSCEPTIBILITY SCALE

	Q7	Q8	Q9
Q7	1.00		
Q8	0.40	1.00	
Q9	0.18	0.30	1.00
Item to			
total	0.36	0.46	0.29

III. INTERITEM AND CORRECTED ITEM TO TOTAL CORRELATIONS OF THE BENEFITS OF RX SCALE

	RXBEN1	RXBEN2	RXBEN3
RXBEN1	1.00		
RXBEN2	0.32	1.00	
RXBEN3	0.56	0.41	1.00
Item to			
total	0.52	0.41	0.60

IV. INTERITEM AND CORRECTED ITEM TO TOTAL CORRELATIONS OF
THE COSTS OF RX SCALE

	RXCOST1	RXCOST1	RXCOST3	RXCOST4
RXCOST1	1.00			
RXCOST2	0.10	1.00		
RXCOST3	0.23	0.25	1.00	
RXCOST4	0.08	0.20	0.15	1.00
Item to total	0.20	0.27	0.33	0.21

V. INTERITEM AND CORRECTED ITEM TO TOTAL CORRELATIONS OF THE
BENEFITS OF HR SCALE

	HRBEN1	HRBEN2	HRBEN3
HRBEN1	1.00		
HRBEN2	-0.08	1.00	
HRBEN3	0.62	-0.07	1.00
Item to total	0.40	-0.08	0.41

VI. INTERITEM AND CORRECTED ITEM TO TOTAL CORRELATIONS OF
THE COSTS OF HR SCALE

	HRCOST1	HRCOST2	HRCOST3
HRCOST1	1.00		
HRCOST2	0.01	1.00	
HRCOST3	0.30	-0.09	1.00
Item to total	0.22	-0.05	0.15

VII. INTERITEM AND CORRECTED ITEM TO TOTAL CORRELATIONS OF
THE NONEXPERIENTIAL DOMAIN OF HYPERTENSION SCALE

	Q13	Q14	Q16	Q19	Q21
Q13	1.00				
Q14	0.67	1.00			
Q16	0.28	0.42	1.00		
Q19	0.33	0.32	0.28	1.00	
Q21	0.36	0.42	0.39	0.41	1.00

Item to
total   0.56   0.64   0.46   0.47   0.54

VIII. INTERITEM AND CORRECTED ITEM TO TOTAL CORRELATIONS OF
THE EXPERIENTIAL DISEASE DOMAIN OF HYPERTENSION SCALE

	Q15	Q17	Q22
Q15	1.00		
Q17	0.45	1.00	
Q22	0.33	0.38	1.00

Item to
total   0.47   0.51   0.42

IX. INTERITEM AND CORRECTED ITEM TO TOTAL CORRELATIONS OF
THE EXPERIENTIAL TREATMENT DOMAIN OF HYPERTENSION SCALE

	Q12	Q18	Q20
Q12	1.00		
Q18	0.38	1.00	
Q20	0.37	0.34	1.00

Item to
total   0.46   0.43   0.43

Note: Items that were deleted from scales are underlined.

      Measures of the following variables depended on
whether or not the respondent used Rx or HR: RXBEN1 = Q43 or
Q50, RXBEN2 = Q44 or Q51, RXBEN3 = Q45 or Q52, RXCOST1 = Q46
or Q53, RXCOST2 = Q47 or Q54, RXCOST3 = Q48 or Q55, RXCOST4
= Q49 or Q56, HRBEN1 = Q57A or Q63, HRBEN2 = Q58A or Q64,
HRBEN3 = Q59A or Q65, HRCOST1 = Q60A or Q66, HRCOST2 = Q61A
or Q67, HRCOST3 = Q62A or Q68.

Perception of Severity

In the first set of statements, I would like to find out your beliefs about how serious high blood pressure is. I would like for you to respond to each statement on a scale ranging from 1 to 5, where 1 is Strongly Agree and 5 is Strongly Disagree.

Q1   I believe that high blood pressure is a serious disease.

1. Strongly Agree
2. Moderately Agree
3. Neutral
4. Moderately Disagree
5. Strongly Disagree
9. No answer

Q2   I live with a certain fear that comes from having high blood pressure.

1. Strongly Agree
2. Moderately Agree
3. Neutral
4. Moderately Disagree
5. Strongly Disagree
9. No answer

Q3   High blood pressure cannot kill you.

1. Strongly Agree
2. Moderately Agree
3. Neutral
4. Moderately Disagree
5. Strongly Disagree
9. No answer

Q4   High blood pressure does not interfere with my social life.

1. Strongly Agree
2. Moderately Agree
3. Neutral
4. Moderately Disagree
5. Strongly Disagree
9. No answer

Q5   Some people view high blood pressure in different ways. Do you hold any of the following views?

1. A Nervous Condition
2. A Blood Disorder
3. Other _____

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| Q6 | Has anything ever happened in your life to make you think about how serious high blood pressure is? | 1. Yes
2. No
8. Don't know
9. No answer | GO TO Q11
GO TO Q12
GO TO Q12
GO TO Q12 |

Q7   Please explain what
        happened.

_____

_____

_____

Perception of Susceptibility

Next, I would like to find out how much you believe yourself to be at risk of having serious problems from your high blood pressure such as stroke, heart attack, or kidney disease. Remember, respond to these items based upon what you currently do to treat your high blood pressure. We will follow the same answer format as before on the 1 (Strongly Agree) to 5 (Strongly Disagree) scale.

| Q8 | I believe that I could experience such things as a stroke, a heart attack or kidney problems as a result of my high blood pressure. | 1. Strongly Agree
2. Moderately Agree
3. Neutral
4. Moderately Disagree
5. Strongly Disagree
9. No answer |

| Q9 | If I do not take care of myself, there is a good chance that I will suffer from serious health problems caused by my high blood pressure. | 1. Strongly Agree
2. Moderately Agree
3. Neutral
4. Moderately Disagree
5. Strongly Disagree
9. No answer |

| Q10 | I do not believe that I am at-risk for having a stroke, heart attack or kidney problems because I have high blood pressure. | 1. Strongly Agree
2. Moderately Agree
3. Neutral
4. Moderately Disagree
5. Strongly Disagree
9. No answer |

| Q11 | I do not think that I will experience any major problems in the future that are caused by my high blood pressure. | 1. Strongly Agree
2. Moderately Agree
3. Neutral
4. Moderately Disagree
5. Strongly Disagree
9. No answer |

Q12   Has anything ever
       happened in your life to   1. Yes   GO TO Q18
       make you think about how   2. No   GO TO Q19
       much at-risk you are for   8. Don't know   GO TO Q19
       having serious problems   9. No answer   GO TO Q19
       with your high blood
       pressure?

Q13   Please explain what   _____
       happened.   _____
                                    _____

Hypertension-Specific Temporal Orientation

The following questions are about your high blood pressure and its treatment. Therefore, when giving your response, make sure that you are <u>only</u> referring to what your feelings are when it comes to your high blood pressure and the way you treat it. Again, we will be using the same 1 to 5 response scale.

Q14   As long as I am feeling   1. Strongly Agree
       good now, it is not   2. Moderately Agree
       important to use any kind   3. Neutral
       of medicines for my high   4. Moderately Disagree
       blood pressure.   5. Strongly Disagree
                                        9. No answer

Q15   I treat my high blood   1. Strongly Agree
       pressure now so that I can   2. Moderately Agree
       avoid future problems.   3. Neutral
                                        4. Moderately Disagree
                                        5. Strongly Disagree
                                        6. No answer

Q16   I see no sense in thinking   1. Strongly Agree
       about possible problems   2. Moderately Agree
       with my high blood   3. Neutral
       pressure right now because   4. Moderately Disagree
       they may not happen.   5. Strongly Disagree
                                        9. No answer

Q17   The way high blood   1. Strongly Agree
       pressure affects me in the   2. Moderately Agree
       future is important to me.   3. Neutral
                                        4. Moderately Disagree
                                        5. Strongly Disagree
                                        9. No answer

Q18   I only live day-to-day with   1. Strongly Agree
       my high blood pressure   2. Moderately Agree
       without thinking about how   3. Neutral
       it might affect me in the   4. Moderately Disagree
       future.   5. Strongly Disagree
                                        9. No answer

Q19   It is important to me to   1. Strongly Agree
       avoid future health   2. Moderately Agree
       problems caused by my   3. Neutral
       high blood pressure.   4. Moderately Disagree
                                        5. Strongly Disagree
                                        9. No answer

Q20   I will deal with any problem with my high blood pressure if it happens, but I do not think about it before it happens.

1. Strongly Agree
2. Moderately Agree
3. Neutral
4. Moderately Disagree
5. Strongly Disagree
9. No answer

Q21   I think about potential problems that could occur later with my high blood pressure.

1. Strongly Agree
2. Moderately Agree
3. Neutral
4. Moderately Disagree
5. Strongly Disagree
9. No answer

Q22   I think it is a waste to take blood pressure medication when I don't feel like my blood pressure is high.

1. Strongly Agree
2. Moderately Agree
3. Neutral
4. Moderately Disagree
5. Strongly Disagree
9. No answer

Q23   I take my blood pressure medication mainly to have good health later on.

1. Strongly Agree
2. Moderately Agree
3. Neutral
4. Moderately Disagree
5. Strongly Disagree
9. No answer

Q24   I take my blood pressure medication to keep me healthy now rather than thinking about the future.

1. Strongly Agree
2. Moderately Agree
3. Neutral
4. Moderately Disagree
5. Strongly Disagree
9. No answer

Q25   I think about how my high blood pressure might affect me in the future.

1. Strongly Agree
2. Moderately Agree
3. Neutral
4. Moderately Disagree
5. Strongly Disagree
9. No answer

Q26   If I did not take my blood pressure medication for a week, it would not bother me.

1. Strongly Agree
2. Moderately Agree
3. Neutral
4. Moderately Disagree
5. Strongly Disagree
9. No answer

Q27 I see taking blood pressure   1. Strongly Agree
     medication as an   2. Moderately Agree
     investment in my future   3. Neutral
     health.   4. Moderately Disagree
                                       5. Strongly Disagree
                                       9. No answer

Q28 I don't think about having   1. Strongly Agree
     high blood pressure unless   2. Moderately Agree
     it starts to bother me.   3. Neutral
                                       4. Moderately Disagree
                                       5. Strongly Disagree
                                       9. No answer

Q29 If I start having problems   1. Strongly Agree
     with my blood pressure   2. Moderately Agree
     medication, I will just stop   3. Neutral
     taking it.   4. Moderately Disagree
                                       5. Strongly Disagree
                                       9. No answer

Drug Use Behavior

This next set of questions deal with how you treat your high blood pressure. I want you only to think about the last 30 days. That day was from (MONTH/DAY) until today. I would like for you to recall something from that day so that it can help you to focus from that time to now. Okay, are you ready? Remember, these questions are referring to what you have done to treat your high blood pressure since (MONTH/DAY).

PRESCRIPTION MEDICATION

For one reason or another, people often have difficulty with taking their medications as prescribed. We are interested in finding out how people with high blood pressure actually take their medications so that we can better understand how people like yourself actually use their medications.

Q30 Do you take any high blood   1. Yes   GO TO Q29
     pressure medication that   2. No   GO TO Q28
     was prescribed by a doctor?   9. No answer   GO TO Q28

Q31 Did you ever take any high   1. Yes   GO TO Q36
     blood pressure medication   2. No   GO TO Q37
     that was prescribed by your   9. No answer   GO TO Q38
     doctor?

Medication Profile

| | MED#1 | MED#2 | MED#3 |

Q32 What medication(s) do you take for
your high blood pressure (HBP)?

Q33 How was it prescribed to be taken?
1. QD
2. BID
3. TID
4. QID
8. DONT KNOW
9. NO ANSWER

Q34 How often do you take your HBP
medication exactly as prescribed?

1. Always
2. Usually
3. Sometimes
4. Never
8. DONT KNOW
9. NO ANSWER

Q35 How many days in the last 30 days
did you take medication exactly as
prescribed?

Q36 If you had to estimate, what
percent of the time would you say you
take your HBP medication exactly as
prescribed?

Q37 How many days in the last 30 days
have you had symptoms from your HBP
(like you felt it was high?)

Q38 Of the (# days) when you had
symptoms, how many days did you take
your HBP medication as prescribed

Q39 Why did you stop?
    GO TO Q38

_____
_____
_____
_____

Q40 Why did you decide not to take
the HBP medication from the start? GO
TO Q38

_____
_____
_____
_____

FOLK REMEDIES

Some people use many different things to help treat their high blood pressure other than their prescription medications. For example, people use vinegar, garlic, and various kinds of teas to help treat their high blood pressure.

Q41	Besides your prescription medication, do you use anything else to treat your high blood pressure?	1. Yes	GO TO Q40
		2. No	GO TO Q39
		9. No answer	GO TO Q39
Q42	Did you ever use at any thing something else to treat your high blood pressure?	1. Yes	GO TO Q50
		2. No	GO TO Q52
		3. No Answer	GO TO Q52

Home Remedies Profile

REM#1   REM#2   REM#3

Q43 What do you use?
1. Vinegar
2. Garlic
3. Teas (Specify)
4. Vitamins (Specify)
5. Combination (Specify)
6. Other (Specify)
9. No answer

Q44 How do you use (NAMED
REMEDY)?

Q45 Would you say that you use
(NAMED REMEDY) on a regular basis?
1. Yes
2. No
8. Don't know
9. No answer

Q46 Do you use (NAMED REMEDY)
only when you feel like your blood
pressure is high?
1. Yes
2. No
8. Don't know
9. No answer

Now, think back to 30 days ago, to
(MONTH/DAY).

Q47 How many days in the last 30
days did you use (NAMED REMEDY) to
treat your high blood pressure?

Q48 If you had to estimate, what
percent of the time would you say you
use (NAMED REMEDY)?

Q49 How many days in the last 30
days have you had symptoms from your
high blood pressure (or felt that your
blood pressure was high)?

	REM#1	REM#2	REM#3

Q50 Of those (# of days given) when
you had symptoms (or felt like your
blood pressure was high), how many
days have used (NAMED REMEDY)?

Q51 What did you use?

_____

_____

_____

Q52 Why did you stop?

_____

_____

_____

Perception of Treatment Efficacy

IF USE PRESCRIPTION MEDICATION
The next set of questions deals with how you feel about your high blood pressure medication.
Please respond to each statement like before on the 1 to 5 scale.

IF DO NOT USE PRESCRIPTION MEDICATION
The next set of questions deals with how you feel about your high blood pressure medication. I
understand that you do not use high blood pressure medication, however, I still would like for
you to respond to the questions as best you can. Please respond to each statement like before
on the 1 to 5 scale.

PRESCRIPTION MEDICATION

Q53   I believe that blood pressure
      medication controls my high
      blood pressure.

1. Strongly Agree
2. Moderately Agree
3. Neutral
4. Moderately Disagree
5. Strongly Disagree
9. No answer

Q54   My high blood pressure would
      not get worse if I stopped
      taking my blood pressure
      medication.

1. Strongly Agree
2. Moderately Agree
3. Neutral
4. Moderately Disagree
5. Strongly Disagree
9. No answer

Q55   Blood pressure medication prevents problems such as heart attacks, strokes and kidney diseases.

1. Strongly Agree
2. Moderately Agree
3. Neutral
4. Moderately Disagree
5. Strongly Disagree
9. No answer

Q56   Taking blood pressure medication keeps my mind more at ease about my high blood pressure.

1. Strongly Agree
2. Moderately Agree
3. Neutral
4. Moderately Disagree
5. Strongly Disagree
9. No answer

Perception of Treatment Barriers

PRESCRIPTION MEDICATION

Now, I am going to ask you about some things that people often say get in the way of taking their prescribed blood pressure medication. After each statement, please respond to each statement like before on the 1 to 5 scale.

Q57   Paying for my blood pressure medication is a problem.

1. Strongly Agree
2. Moderately Agree
3. Neutral
4. Moderately Disagree
5. Strongly Disagree
9. No answer

Q58   Forgetting to take my blood pressure medication is not a problem for me.

1. Strongly Agree
2. Moderately Agree
3. Neutral
4. Moderately Disagree
5. Strongly Disagree
9. No answer

Q59   I do not have trouble getting my HBP prescription(s) refilled.

1. Strongly Agree
2. Moderately Agree
3. Neutral
4. Moderately Disagree
5. Strongly Disagree
9. No answer

Q60   Side effects prevent me from   1. Strongly Agree
taking my blood pressure   2. Moderately Agree
medication as prescribed.   3. Neutral
                                          4. Moderately Disagree
                                          5. Strongly Disagree
                                          9. No answer

Q61   I do not have trouble keeping   1. Strongly Agree
up with how often I am suppose   2. Moderately Agree
to take my blood pressure   3. Neutral
medication.   4. Moderately Disagree
                                          5. Strongly Disagree
                                          9. No answer

USE HOME REMEDIES
Perception of Treatment Efficacy

FOLK REMEDIES

Next, we would like to ask about your feelings and beliefs about (<u>NAMED REMEDY</u>). Again,
Please respond to each statement like before on the 1 to 5 scale.

Q62   Folk remedies (<u>NAMED</u>   1. Strongly Agree
<u>REMEDY</u>) work in controlling   2. Moderately Agree
my high blood pressure.   3. Neutral
                                          4. Moderately Disagree
                                          5. Strongly Disagree
                                          9. No answer

Q63   My high blood pressure would   1. Strongly Agree
not get worse if I stopped using   2. Moderately Agree
folk remedies (<u>NAMED</u>   3. Neutral
<u>REMEDY</u>).   4. Moderately Disagree
                                          5. Strongly Disagree
                                          9. No answer

Q64   Folk remedies (<u>NAMED</u>   1. Strongly Agree
<u>REMEDY</u>) provide me with   2. Moderately Agree
immediate relief since I can feel   3. Neutral
them working in my body.   4. Moderately Disagree
                                          5. Strongly Disagree
                                          9. No answer

Q65   Folk remedies (<u>NAMED</u>   1. Strongly Agree
<u>REMEDY</u>) help to keep the body   2. Moderately Agree
and the blood balanced.   3. Neutral
                                          4. Moderately Disagree
                                          5. Strongly Disagree
                                          9. No answer

Perception of Treatment Barriers

FOLK REMEDIES

Q66   Folk remedies (NAMED   1. Strongly Agree
       REMEDY) do not really work   2. Moderately Agree
       over the long run.   3. Neutral
                                          4. Moderately Disagree
                                          5. Strongly Disagree
                                          9. No answer

Q67   I believe that folk remedies   1. Strongly Agree
       (NAMED REMEDY) are not we..   2. Moderately Agree
       accepted by my doctor.   3. Neutral
                                          4. Moderately Disagree
                                          5. Strongly Disagree
                                          9. No answer

Q68   I feel that I can discuss using   1. Strongly Agree
       folk remedies (NAMED   2. Moderately Agree
       REMEDY) with my doctor or   3. Neutral
       other health care professionals   4. Moderately Disagree
                                          5. Strongly Disagree
                                          9. No answer

Q69   Folk remedies (NAMED   1. Strongly Agree
       REMEDY) do not work   2. Moderately Agree
       continuously in my body like   3. Neutral
       my blood pressure medication.   4. Moderately Disagree
                                          5. Strongly Disagree
                                          9. No answer

NO USE OF HOME REMEDIES
Perception of Treatment Efficacy

FOLK REMEDIES

Next, we would like to get your feelings and beliefs about folk remedies. I understand that you
don't use any remedies, however, I still would like for you to respond to the questions as best
you can. Please respond to each statement like before on the 1 to 5 scale.

Q62   Folk remedies work in   1. Strongly Agree
       controlling high blood pressure   2. Moderately Agree
                                          3. Neutral
                                          4. Moderately Disagree
                                          5. Strongly Disagree
                                          9. No answer

Q63   An individual's high blood
        pressure would not get worse if
        (s)he stopped using folk
        remedies.

1. Strongly Agree
2. Moderately Agree
3. Neutral
4. Moderately Disagree
5. Strongly Disagree
9. No answer

Q64   Folk remedies provide
        immediate relief since they can
        be felt working in the body.

1. Strongly Agree
2. Moderately Agree
3. Neutral
4. Moderately Disagree
5. Strongly Disagree
9. No answer

Q65   Folk remedies help to keep the
        body and the blood balanced.

1. Strongly Agree
2. Moderately Agree
3. Neutral
4. Moderately Disagree
5. Strongly Disagree
9. No answer

Perception of Treatment Barriers

FOLK REMEDIES

Q66   Folk remedies do not really
        work over the long run.

1. Strongly Agree
2. Moderately Agree
3. Neutral
4. Moderately Disagree
5. Strongly Disagree
9. No answer

Q67   Folk remedies are not well
        accepted by doctors.

1. Strongly Agree
2. Moderately Agree
3. Neutral
4. Moderately Disagree
5. Strongly Disagree
9. No answer

Q68   I feel that a person can discuss
        using folk remedies with
        doctors or other health care
        professionals.

1. Strongly Agree
2. Moderately Agree
3. Neutral
4. Moderately Disagree
5. Strongly Disagree
9. No answer

Q69   Folk remedies do not work   1. Strongly Agree
        continuously in my body like   2. Moderately Agree
        blood pressure medication.   3. Neutral
                                           4. Moderately Disagree
                                           S. Strongly Disagree
                                           9. No answer

Q70   If I get sick from my high blood   1. Strongly Agree
        pressure (e.g., heart attack,   2. Moderately Agree
        stroke, kidney disease), it is my 3. Slightly Agree
        own behavior which determines   4. Slightly Disagree
        how soon I get well again.   S. Moderately Disagree
                                           6. Strongly Disagree
                                           8. Don't know
                                           9. No answer

Q71   No matter what I do, if I am   1. Strongly Agree
        going to get sick from my high   2. Moderately Agree
        blood pressure, I will get sick.   3. Slightly Agree
                                           4. Slightly Disagree
                                           S. Moderately Disagree
                                           6. Strongly Disagree
                                           8. Don't know
                                           9. No answer

Q72   Having regular contact with my   1. Strongly Agree
        physician is the best way for me   2. Moderately Agree
        to avoid getting sick from my   3. Slightly Agree
        high blood pressure.   4. Slightly Disagree
                                           S. Moderately Disagree
                                           6. Strongly Disagree
                                           8. Don't know
                                           9. No answer

Q73   Most things that affect my high   1. Strongly Agree
        blood pressure happen to me by   2. Moderately Agree
        accident.   3. Slightly Agree
                                           4. Slightly Disagree
                                           S. Moderately Disagree
                                           6. Strongly Disagree
                                           8. Don't know
                                           9. No answer

Q74   Whenever I don't feel well   1. Strongly Agree
        because of my high blood   2. Moderately Agree
        pressure, I should consult a   3. Slightly Agree
        medically trained professional.   4. Slightly Disagree
                                           S. Moderately Disagree
                                           6. Strongly Disagree
                                           8. Don't know
                                           9. No answer

Q75   I am in control of my high
blood pressure.

1. Strongly Agree
2. Moderately Agree
3. Slightly Agree
4. Slightly Disagree
5. Moderately Disagree
6. Strongly Disagree
8. Don't know
9. No answer

Q76   My family has a lot to do with
my becoming sick due to high
blood pressure or staying
healthy.

1. Strongly Agree
2. Moderately Agree
3. Slightly Agree
4. Slightly Disagree
5. Moderately Disagree
6. Strongly Disagree
8. Don't know
9. No answer

Q77   When I get sick from my high
blood pressure I am to blame.

1. Strongly Agree
2. Moderately Agree
3. Slightly Agree
4. Slightly Disagree
5. Moderately Disagree
6. Strongly Disagree
8. Don't know
9. No answer

Q78   Luck plays a big part in
determining how soon I will
recover from problems with my
high blood pressure.

1. Strongly Agree
2. Moderately Agree
3. Slightly Agree
4. Slightly Disagree
5. Moderately Disagree
6. Strongly Disagree
8. Don't know
9. No answer

Q79   Health professionals control my
high blood pressure.

1. Strongly Agree
2. Moderately Agree
3. Slightly Agree
4. Slightly Disagree
5. Moderately Disagree
6. Strongly Disagree
8. Don't know
9. No answer

Q80   My good health is largely a   1. Strongly Agree
       matter of good fortune.   2. Moderately Agree
                                            3. Slightly Agree
                                            4. Slightly Disagree
                                            5. Moderately Disagree
                                            6. Strongly Disagree
                                            8. Don't know
                                            9. No answer

Q81   The main thing which affects   1. Strongly Agree
       my high blood pressure is what   2. Moderately Agree
       I myself do.   3. Slightly Agree
                                            4. Slightly Disagree
                                            5. Moderately Disagree
                                            6. Strongly Disagree
                                            8. Don't know
                                            9. No answer

Q82   If I take care of myself, I can   1. Strongly Agree
       avoid the negative consequences   2. Moderately Agree
       of high blood pressure.   3. Slightly Agree
                                            4. Slightly Disagree
                                            5. Moderately Disagree
                                            6. Strongly Disagree
                                            8. Don't know
                                            9. No answer

Q83   When I recover from problems   1. Strongly Agree
       with high blood pressure, it's   2. Moderately Agree
       usually because other people   3. Slightly Agree
       (for example, doctors, nurses,   4. Slightly Disagree
       family, friends) have been   5. Moderately Disagree
       taking good care of me.   6. Strongly Disagree
                                            8. Don't know
                                            9. No answer

Q84   No matter what I do, I'm likely   1. Strongly Agree
       to get sick from my high blood   2. Moderately Agree
       pressure.   3. Slightly Agree
                                            4. Slightly Disagree
                                            5. Moderately Disagree
                                            6. Strongly Disagree
                                            8. Don't know
                                            9. No answer

Q8S   If it's meant to be, I will stay healthy.

1. Strongly Agree
2. Moderately Agree
3. Slightly Agree
4. Slightly Disagree
5. Moderately Disagree
6. Strongly Disagree
8. Don't know
9. No answer

Q86   If I take the right actions to treat my high blood pressure, I can stay healthy.

1. Strongly Agree
2. Moderately Agree
3. Slightly Agree
4. Slightly Disagree
5. Moderately Disagree
6. Strongly Disagree
8. Don't know
9. No answer

Q87   Regarding my high blood pressure, I can only do what my doctor tells me to do.

1. Strongly Agree
2. Moderately Agree
3. Slightly Agree
4. Slightly Disagree
5. Moderately Disagree
6. Strongly Disagree
8. Don't know
9. No answer

Background Information

This last set of questions deals with background information about yourself. This information is needed to help us better understand your responses to all of the other questions in this interview.

Q88   What ethnic group do you belong to?

1. Non-Hispanic Black or African American
2. Non-Hispanic White or Caucasian or Anglo American
9. No answer

Q89   Are you male or female?

1. Male
2. Female
9. No answer

Q90   In what month and year were you born?

_____ Month/Year

Q91   What is the highest level of high school or college have you completed?

_____ years

Q92   What is your occupation?   _____ _____

Q93   How many people live in your   _____
       household including yourself?

Q94   What was your approximate   1. < $5000
       household income before taxes, 2. $5000 to 9999
       in 1992?   3. $10,000 to 12,499
                                      4. $12,500 to 14,999
                                      5. $15,000 to 19,999
                                      6. $20,000 to 29,999
                                      7. $30,000 to 39,999
                                      8. $40,000 to 49,999
                                      9. $50,000 to 69,999
                                      10. $70,000 or more

Q95   In what city or town do you   _____
       live?

Q96   What year were you first   _____ year
       diagnosed as having high blood
       pressure?

Q97   How often do you see a doctor   1. Every Week
       about your blood pressure?   2. Every Month
                                       3. Every 3 months
                                       3. Every 6 months
                                       4. Once a year
                                       5. When I feel sick
                                       6. When I need a new prescription (No refills
                                          left)
                                       7. Other
                                       8. Don't know
                                       9. No answer

Q98   How often do you talk with   1. Always
       your pharmacist about your   2. Sometimes
       blood pressure medications?   3. Usually
                                       4. Never
                                       8. Don't know
                                       9. No answer

TEXT OF SCREENER AND SURVEY INSTRUMENT OF FINAL STUDY

ID# _____
TIME BEGIN: _____

SCREENER

Hello, my name is _____ and I am calling from the University of Florida in Gainesville. Your telephone number was randomly selected for a research study about high blood pressure.

A. Is there someone in your household at least 18 years old who has high blood pressure?

     IF "NO" THANK AND TERMINATE
     IF "YES" ASK: "MAY I PLEASE SPEAK WITH THEM?"

(IF A DIFFERENT PERSON COMES ON THE PHONE REPEAT INTRODUCTION).

University of Florida researchers are conducting this short survey in Northern Florida for gathering opinions and concerns of people having high blood pressure and having to treat it. This study will help health care professionals treat people with high blood pressure more effectively.

This is not a sales call. Your answers will be kept anonymous and confidential.

B. Have you been told by a doctor that you have high blood pressure?

1	YES	(CONTINUE)
2	NO	(GO TO S8)
3	DON'T REMEMBER	(GO TO S8)

C. Have you had high blood pressure for longer than one year?

1	YES	(CONTINUE)
2	NO	(GO TO S8)
3	DON'T REMEMBER	(GO TO S8)

D. Has your doctor prescribed at least one medication for your high blood pressure?

    1   YES   (CONTINUE)
    2   NO   (GO TO S8)
    3   DON'T REMEMBER   (GO TO S8)

E. Have you ever had a stroke?

    1   YES   (CONTINUE)
    2   NO   (GO TO S8)
    3   DON'T REMEMBER   (GO TO S8)

F. Have you ever had a heart attack?

    1   YES   (CONTINUE)
    2   NO   (GO TO S8)
    3   DON'T REMEMBER   (GO TO S8)

G. Have you ever had kidney problems caused by your high blood pressure?

    1   YES   (CONTINUE)
    2   NO   (GO TO S8)
    3   DON'T REMEMBER   (GO TO S8)

H. Have you ever had blindness caused by high blood pressure?

    1   YES   (CONTINUE)
    2   NO   (GO TO S8)
    3   DON'T REMEMBER   (GO TO S8)

I. What ethnic group do you belong to? (READ RESPONSES)

    1   NON-HISPANIC BLACK OR AFRICAN AMERICAN
    2   NON-HISPANIC WHITE OR CAUCASIAN
    3   HISPANIC   (GO TO S8)
    4   ASIAN   (GO TO S8)
    S   OTHER   (GO TO S8)
    6   NO ANSWER   (GO TO S8)

J. In what county do you reside? (DON'T READ RESPONSES)

    1   ALACHUA
    2   DUVAL
    3   JACKSON
    4   MADISON
    S   HAMILTON
    6   JEFFERSON
    88   DON'T REMEMBER   (GO TO S8)
    99   NO ANSWER   (GO TO S8)
    (IF OTHER THAN COUNTIES LISTED GO TO S8)

K. In what city or town do you live? (DON'T READ RESPONSES)

      1   CAMPBELLTON
      2   GAINESVILLE (METRO)
      3   GREENVILLE
      4   GREENWOOD
      5   JACKSONVILLE (METRO)
      6   JASPER
      7   MONTICELLO
      8   SNEEDS

(IF NONE OF CITIES LISTED GO TO S8)

METRO OR NONMETRO?

      1   METROPOLITAN
      2   NONMETROPOLITAN

S8   I am sorry but we are selecting only those individuals who have met specified criterion needed for the research. However, we would like to thank you for your willingness to participate.

SURVEY INSTRUMENT

If at any time you have a question, feel free to ask.

First, I would like to find out your beliefs about high blood pressure. I would like for you to rate each of the following statements on a scale of 1 to 5 with a 1 meaning that you "strongly agree" with the statement and a S meaning that you "strongly disagree" with the statement. You can use any number in between. The first statement is:

	STRONGLY AGREE	SOMEWHAT AGREE	NEUTRAL	STRONGLY DISAGREE	DON'T KNOW
Q1 I believe that high blood pressure is a serious disease.	1	2	3	4	88
Q2 I live with a certain fear that comes from having high blood pressure.	1	2	3	4	88
Q3 High blood pressure does not interfere with my social life.	1	2	3	4	88

Q4 Some people view high blood pressure in different ways. Do you hold any of the following views? That high blood pressure is (READ LIST)

    1 A NERVOUS CONDITION -- WHERE IT IS CAUSED BY YOUR NERVES
    2 A BLOOD DISORDER -- WHERE THE BLOOD IS TOO THICK/THIN, HOT/COLD, OR
    TOO RICH
    3 OTHER: _____
    88 DON'T KNOW
    99 NO ANSWER

QS Has anything ever happened in your life to make you think about how serious high blood pressure is?

    1 YES   (CONTINUE)
    2 NO   (GO TO Q7)
    88 DON'T KNOW (GO TO Q7)
    99 NO ANSWER   (GO TO Q7)

Q6 Please explain briefly what happened. (DON'T READ RESPONSES)

    1 DEATH OF A FAMILY MEMBER
    2 YOU OR A FAMILY MEMBER GOT SICK FROM HIGH BLOOD PRESSURE
    3 I HEARD ABOUT IT ON TV OR READ IT IN A NEWSPAPER OR MAGAZINE
    4 A HEALTH CARE PROFESSIONAL TOLD ME ABOUT HIGH BLOOD PRESSURE
    S OTHER: _____

Now, I would like to find out how much you believe yourself to be at risk of having serious problems from your high blood pressure such as stroke, heart attack, or kidney disease. Remember, respond to these items based upon what you currently do to treat your high blood pressure. We will follow the same format as before on the 1 to 5 scale with a 1 meaning "strongly agree" and a 5 meaning "strongly disagree." Remember, you can use any number in between. The first statement is:

```
                 STRONGLY SOMEWHAT        STRONGLY DON'T
                  AGREE    AGREE  NEUTRAL DISAGREE KNOW
```

Q7 I believe that I could experience
    such things as a stroke, a heart
    attack or kidney problems as a
    result of my high blood pressure. 1   2   3   4   88

Q8 I do not believe that I am at-risk
    for having a stroke, heart attack
    or kidney problems because I have
    high blood pressure.   1   2   3   4   88

Q9 I do not think that I will
    experience any major problems in the
    future that are caused by my high
    blood pressure.   1   2   3   4   88

Q10 Has anything ever happened in your life to make you think about how much at risk you are for having serious problems with your high blood pressure, such as strokes, heart attacks, or kidney problems?   Please answer yes or no.

```
   1  YES         (CONTINUE)
   2  NO          (GO TO Q12)
  88 DON'T KNOW   (GO TO Q12)
  99 NO ANSWER    (GO TO Q12)
```

Q11 Please explain briefly what happened. (DON'T READ RESPONSES)

   1 DEATH OF A FAMILY MEMBER
   2 YOU OR A FAMILY MEMBER GOT SICK FROM HIGH BLOOD PRESSURE
   3 I HEARD ABOUT IT ON TV OR READ IT IN A NEWSPAPER OR MAGAZINE
   4 A HEALTH CARE PROFESSIONAL TOLD ME ABOUT HIGH BLOOD PRESSURE
   5 OTHER: _____

The following questions are about your high blood pressure and its treatment. Therefore, when giving your response, make sure that you are only referring to what your feelings are when it comes to your blood pressure and the ways you treat it. Some people prefer to deal with high blood pressure on a day-by-day basis and not be concerned about their future. Whereas, other people are driven mainly by their concerns with how high blood pressure might affect them in the future. Take a minute to think about where you stand. (PAUSE) Okay, again we will be using the same 1 to 5 scale with a 1 meaning "strongly agree" and a 5 meaning "strongly disagree." The first statement is:

STRONGLY SOMEWHAT   STRONGLY DON'T
<u>AGREE</u> <u>AGREE</u> <u>NEUTRAL</u> <u>DISAGREE</u> <u>KNOW</u>

Q12 As long as I am feeling good now,
it is not important to use any
kind of medicines for my high
blood pressure.   1   2   3   4   88

Q13 I treat my high blood pressure
now so that I can avoid future
problems.   1   2   3   4   88

Q14 The way high blood pressure
affects me in the future is
important to me.   1   2   3   4   88

Q15 I only live day-to-day with my
high blood pressure without
thinking about how it might
affect me in the future.   1   2   3   4   88

Q16 It is important to me to avoid
future health problems caused
by my high blood pressure.   1   2   3   4   88

Q17 I will deal with any problem with
my high blood pressure if it
happens, but I do not think about
it before it happens.   1   2   3   4   88

Q18 I think it is a waste to take blood
pressure medication when I don't
feel like my blood pressure is
high.   1   2   3   4   88

Q19 I take my blood pressure medication
mainly to have good health later
on.   1   2   3   4   88

Q20 If I did not take my blood pressure
medication for a week, it would
not bother me.   1   2   3   4   88

Q21 I see taking blood pressure
medication as an investment in
my future health.   1   2   3   4   88

	STRONGLY	SOMEWHAT		STRONGLY	DON'T
	AGREE	AGREE	NEUTRAL	DISAGREE	KNOW

Q22 I don't think about having high
blood pressure unless it starts
to bother me. 1   2   3   4   8S

DRUG USE BEHAVIOR

For one reason or another people often have difficulty with taking their medications as
prescribed. We are interested in finding out how people with high blood pressure actually take
their medications so that we can better understand how people like yourself actually use their
medications. I want you to think about how you have treated your high blood pressure in the
last 30 days.

Q23 Do you currently take any high blood pressure medication that was prescribed by a doctor?

1 YES	(GO TO Q25)
2 NO	(GO TO Q24)
88 DON'T KNOW	(GO TO Q24)
99 NO ANSWER	(GO TO Q24)

Q24 Did you <u>ever</u> take any high blood pressure medication that was prescribed by your doctor?

1 YES	(GO TO Q31)
2 NO	(GO TO Q32)
88 DON'T KNOW	(GO TO Q33)
99 NO ANSWER	(GO TO Q33)

MEDICATION PROFILE

Q25 What medication(s) do you take for your high blood pressure?
(LOOK AT HARD COPY LIST FOR CODES)

CIRCLE WHETHER EACH MEDICATION
IS GENERIC OR BRAND

1 _____ ----> 1 GENERIC   2 BRAND

2 _____ ----> 1 GENERIC   2 BRAND

3 _____ ----> 1 GENERIC   2 BRAND

Q26A How was (MEDICATION #1 FROM ABOVE, prescribed to be taken? (DON'T READ RESPONSES)

      1   ONCE A DAY
      2   TWICE A DAY
      3   THREE TIMES A DAY
      4   FOUR TIMES A DAY
      5   OTHER: _____
  88 DON'T KNOW
  99 NO ANSWER

Q27A How many days in the last 30 days did you take (MEDICATION #1) exactly as prescribed? _____ days.

Q28A If you had to estimate, what percent of the time would you say you take (MEDICATION #1) exactly as prescribed? _____ % of the time.

Q29 How many days in the last 30 days have you had symptoms from your high blood pressure (like you felt it was high)? _____ days.

Q30A Of the __ days when you had symptoms, how many days did you take (MEDICATION #1) as prescribed? _____ days.

Q26B How was (MEDICATION #2 FROM ABOVE, prescribed to be taken? (DON'T READ RESPONSES)

      1   ONCE A DAY
      2   TWICE A DAY
      3   THREE TIMES A DAY
      4   FOUR TIMES A DAY
      5   OTHER: _____
  88 DON'T KNOW
  99 NO ANSWER

Q27B How many days in the last 30 days did you take (MEDICATION #2) exactly as prescribed? _____ days.

Q28B If you had to estimate, what percent of the time would you say you take (MEDICATION #2) exactly as prescribed? _____ % of the time.

Q30B Of the __ days when you had symptoms, how many days did you take (MEDICATION #2) as prescribed? _____ days.

Q26C How was (MEDICATION #3 FROM ABOVE) prescribed to be taken? (DON'T READ RESPONSES)

    1   ONCE A DAY
    2   TWICE A DAY
    3   THREE TIMES A DAY
    4   FOUR TIMES A DAY
    S   OTHER: _____
 88 DON'T KNOW
 99 NO ANSWER

Q27C How many days in the last 30 days did you take (MEDICATION #3) exactly as prescribed? _____ days.

Q28C If you had to estimate, what percent of the time would you say you take (MEDICATION #3) exactly as prescribed? _____ % of the time.

Q30C Of the __ days when you had symptoms, how many days did you take (MEDICATION #3) as prescribed? _____ days

Q31 Why did you stop? (DON'T READ RESPONSES) (GO TO Q33)

    1   COST OF MEDICATION
    2   SIDE EFFECTS OR MADE YOU FEEL BAD
    3   DID NOT THINK YOU NEEDED IT
    4   STARTED USING SOMETHING ELSE: _____
    5   OTHER: _____
 88 DON'T KNOW
 99 NO ANSWER

Q32 Why did you decide not to take the high blood pressure medication from the start? (DON'T READ RESPONSES)

    1   COST OF MEDICATION
    2   DID NOT THINK YOU NEEDED IT
    3   STARTED USING SOMETHING ELSE: _____
    4   OTHER: _____
 88 DON'T KNOW
 99 NO ANSWER

HOME REMEDIES USE BEHAVIOR

Some people use many different things to help treat their high blood pressure other than their prescription medications. For example, people use vinegar, garlic, and various kinds of teas to help treat their high blood pressure.

Q33 Besides your prescription medication, do you use anything else to treat your high blood pressure?

    1 YES   (GO TO Q35)
    2 NO   (CONTINUE)
  88 DON'T KNOW (CONTINUE)
  99 NO ANSWER (CONTINUE)

Q34 Did you ever use at any thing something else to treat your high blood pressure?

    1 YES   (GO TO Q41)
    2 NO   (GO TO Q43)
  88 DON'T KNOW (GO TO Q43)
  99 NO ANSWER (GO TO Q43)

HOME REMEDIES PROFILE

Q35 What do you use? (DON'T READ RESPONSES)

     1   VINEGAR
     2   GARLIC
     3   TEAS: _____
     4   VITAMINS: _____
     5   COMBINATION: _____
     6 ·   OTHER: _____
  88 DON'T KNOW
  99 NO ANSWER

Choice 1 (FROM Q35)

Q36A How do you use _____? (DON'T READ RESPONSES)

     1   DRINK/EAT IT ALONE OR MIX IT WITH WATER
     2   COOK WITH IT
     3   TAKE IT AS A TABLET OR CAPSULE
     4   OTHER: _____

Q37A How many days in the last 30 days did you use _____?
_____ days.

Q38A If you had to estimate, what percent of the time would you say you use _____?
_____ % of time.

Q39 How many days in the last 30 days have you had symptoms from your high blood pressure (like you felt it was high)? _____ days.

Q40A Of those (FROM Q39) days when you had symptoms, how many days have you used ___?
_____ days.

Choice 2 (FROM Q3S)

Q36B How do you use _____? (DON'T READ RESPONSES)

     1   DRINK/EAT IT ALONE OR MIX IT WITH WATER
     2   COOK WITH IT
     3   TAKE IT AS A TABLET OR CAPSULE
     4   OTHER: _____

Q37B How many days in the last 30 days did you use _____?
_____ days.

Q38B If you had to estimate, what percent of the time would you say you use _____?
_____ % of time.

Q40B Of those (FROM Q39) days when you had symptoms, how many days have you used ____?
_____ days.

Choice 3 (FROM Q35)

Q36C How do you use _____? (DON'T READ RESPONSES)

     1   DRINK/EAT IT ALONE OR MIX IT WITH WATER
     2   COOK WITH IT
     3   TAKE IT AS A TABLET OR CAPSULE
     4   OTHER: _____

Q37C How many days in the last 30 days did you use _____?
_____ days.

Q38C If you had to estimate, what percent of the time would you say you use _____?
_____ % of time.

Q40C Of those (FROM Q39) days when you had symptoms, how many days have you used ____?
_____ days.

Q41 What did you use? (DON'T READ RESPONSES) (3 RESPONSES POSSIBLE)

     1   VINEGAR
     2   GARLIC
     3   TEAS: _____
     4   VITAMINS: _____
     S   COMBINATION: _____
     6   OTHER: _____
 88 DON'T KNOW
 99 NO ANSWER

Q42A Why did you stop using (CHOICE 1 FROM Q41)? (DON'T READ RESPONSES)

    1   IT DID NOT SEEM TO WORK
    2   THE DOCTOR TOLD YOU TO
    3   IT MADE YOU FEEL BAD
    4   OTHER: _____
88 DON'T KNOW
99 NO ANSWER

Q42B Why did you stop using (CHOICE 2 FROM Q41)? (DON'T READ RESPONSES)

    1   IT DID NOT SEEM TO WORK
    2   THE DOCTOR TOLD YOU TO
    3   IT MADE YOU FEEL BAD
    4   OTHER: _____
88 DON'T KNOW
99 NO ANSWER

Q42C Why did you stop using (CHOICE 3 FROM Q41)? (DON'T READ RESPONSES)

    1   IT DID NOT SEEM TO WORK
    2   THE DOCTOR TOLD YOU TO
    3   IT MADE YOU FEEL BAD
    4   OTHER: _____
88 DON'T KNOW
99 NO ANSWER

USE PRESCRIPTION MEDICATION

Next, we would like to know how you feel about your high blood pressure medication. Please respond to each statement like before on the 1 to 5 scale with a 1 meaning "strongly agree" and a 5 meaning "strongly disagree." The first statement is:

	STRONGLY AGREE	SOMEWHAT AGREE	NEUTRAL	STRONGLY DISAGREE	DON'T KNOW
Q43 I believe that blood pressure medication controls my high blood pressure.	1	2	3	4	88
Q44 Blood pressure medication prevents problems such as heart attacks, strokes and kidney diseases.	1	2	3	4	88
Q4S Taking blood pressure medication keeps my mind more at ease about my high blood pressure.	1	2	3	4	88

Now I am going to ask you about some things that people often say get in the way of taking their prescribed blood pressure medication. After each statement, please respond like before on the 1 to S scale. The first statement is:

	STRONGLY AGREE	SOMEWHAT AGREE	NEUTRAL	STRONGLY DISAGREE	DON'T KNOW

Q46 Paying for my blood pressure
   medication is a problem.   1   2   3   4   88

Q47 Forgetting to take my blood
   pressure medication is not
   a problem for me.   1   2   3   4   88

Q48 I do not have trouble getting
   my high blood pressure
   prescriptions refilled.   1   2   3   4   88

Q49 Side effects, such as drowsiness
   or excessive urination, prevent
   me from taking my blood pressure
   medication as prescribed.   1   2   3   4   88

NO USE OF PRESCRIPTION MEDICATION

Next, we would like to know how you feel about high blood pressure medication. I understand that you do not use high blood pressure medications, however, I still would like for you to respond to the questions as best you can. Please respond to each statement like before on the 1 to S scale with a 1 meaning "strongly agree" and a S meaning "strongly disagree." The first statement is:

	STRONGLY AGREE	SOMEWHAT AGREE	NEUTRAL	STRONGLY DISAGREE	DON'T KNOW

Q50 Blood pressure medication
   controls high blood pressure.   1   2   3   4   88

QS1 Blood pressure medication prevents
   problems such as heart attacks,
   strokes and kidney diseases.   1   2   3   4   88

QS2 Taking blood pressure medication
   keeps a person's mind more at
   ease about their high blood
   pressure.   1   2   3   4   88

Now I am going to ask you about some things that people often say get in the way of taking their prescribed blood pressure medication. After each statement, please respond like before on the 1 to 5 scale. The first statement is:

STRONGLY SOMEWHAT   STRONGLY DON'T
AGREE   AGREE NEUTRAL DISAGREE KNOW

Q53 Paying for blood pressure
    medication is a problem.   1   2   3   4   88

Q54 Forgetting to take blood
    pressure medication is not
    a problem.   1   2   3   4   88

Q55 A person would not have trouble
    getting high blood pressure
    prescriptions refilled.   1   2   3   4   88

Q56 Side effects, such as drowsiness
    or excessive urination, prevent
    people from taking blood pressure
    medication as prescribed.   1   2   3   4   88

USE HOME REMEDIES

Choice 1,2 and 3 (FROM Q35)

Next, we would like to ask about your feelings and beliefs about _____. Just for convenience, we are going to refer to these as home remedies. Using the same 1 to 5 scale with a 1 meaning "strongly agree" and a 5 meaning "strongly disagree," I would like you to rate your beliefs about these home remedies. The first statement is:

STRONGLY SOMEWHAT   STRONGLY DON'T
AGREE   AGREE NEUTRAL DISAGREE KNOW

Q57 Home remedies work in controlling
    my high blood pressure.   1   2   3   4   88

Q58 My high blood pressure would not
    get worse if I stopped using
    home remedies.   1   2   3   4   88

Q59 Home remedies help to keep the
    body and blood balanced.   1   2   3   4   88

Q60 I believe that home remedies are
    not well accepted by my doctor. 1   2   3   4   88

STRONGLY SOMEWHAT   STRONGLY DON'T
AGREE   AGREE NEUTRAL DISAGREE KNOW

Q61 I feel that I can discuss using
home remedies with my doctor or
other health care professionals. 1   2   3   4   88

Q62 Home remedies do not work
continuously in my body like my
blood pressure medication.   1   2   3   4   88

NO USE OF HOME REMEDIES

Next, we would like to get your feelings and beliefs about home remedies such as vinegar, garlic, and various kinds of teas. I understand that you don't use any home remedies, however, I still would like for you to respond to the questions as best you can. Please respond to each statement like before on the 1 to 5 scale with a 1 meaning "strongly agree" and a 5 meaning "strongly disagree." The first statement is:

STRONGLY SOMEWHAT   STRONGLY DON'T
AGREE   AGREE NEUTRAL DISAGREE KNOW

Q63 Home remedies work in controlling
high blood pressure.   1   2   3   4   88

Q64 An individual's high blood
pressure would not get worse if
they stopped using home
remedies.   1   2   3   4   88

Q65 Home remedies help to keep the
body and blood balanced.   1   2   3   4   88

Q66 Home remedies are not well
accepted by doctors.   1   2   3   4   88

Q67 I feel that a person can discuss
using home remedies with doctors
or other health care
professionals.   1   2   3   4   88

Q68 Home remedies do not work
continuously in the body like
blood pressure medication.   1   2   3   4   88

BACKGROUND INFORMATION

These last questions deal with background information about yourself. This information is needed to help us better understand your responses to all of the other questions in this interview.

Q71 In what month and year were you born? _____ MONTH _____ YEAR.

Q72 What is the highest grade of school or college you have completed? (DON'T READ RESPONSES)

       1-11   GRADE OF SCHOOLING COMPLETED
       12   HIGH SCHOOL GRADUATE
       13   TECHNICAL TRAINING/TRADE SCHOOL
       14   ONE YEAR OF COLLEGE
       1S   TWO YEARS OF COLLEGE
       16   ASSOCIATE'S DEGREE
       17   THREE YEARS OF COLLEGE
       18   FOUR YEARS OF COLLEGE
       19   FIVE YEARS OF COLLEGE
       20   BACHELOR'S DEGREE
       21   SOME GRADUATE WORK
       22   MASTER'S DEGREE
       23   SOME PH.D. WORK
       24   PH.D. DEGREE
       2S   POST-DOCTORATE WORK
       26   OTHER _____
       88   DON'T KNOW
       99   NO ANSWER

Q73 What is your occupation? _____

Q73B Are you the head of the household?

    1   YES
    2   NO
 88 DON'T KNOW
 99 NO ANSWER

        IF RESPONDENT IS NOT HEAD OF HOUSEHOLD ASK:

        Is the head of household: (1) Under 6S
                      (2) 6S and over

Q74 How many people live in your household including yourself? _____

Q75 What was your approximate household income before taxes in 1992?

1	Under $6000	11	$17000 to $18000
2	$6000 to $7000	12	$18000 to $19000
3	$7000 to $8000	13	$19000 to $20000
4	$8000 to $9000	14	$20000 to $22000
5	$9000 to $10000	15	$22000 to $23000
6	$10000 to $11000	16	$23000 to $24000
7	$11000 to $12000	17	$24000 to $25000
8	$12000 to $14000	18	$25000 to $29000
9	$14000 to $15000	19	$29000 to $30000
10	$15000 to $17000	20	Over $30000

88   DON'T KNOW
99   REFUSED/NO ANSWER

Q77 What year were you first diagnosed as having high blood pressure?

_____

Q78 How often do you see a doctor about your high blood pressure? (DON'T READ RESPONSES)

1   EVERY WEEK
2   EVERY MONTH
3   EVERY 3 MONTHS
4   EVERY 6 MONTHS
5   ONCE A YEAR
6   WHEN I FEEL SICK
7   WHEN I NEED A NEW PRESCRIPTION (NO REFILLS LEFT)
8   OTHER: _____
88 DON'T KNOW
99 NO ANSWER

Q79 How often do you talk with your pharmacist about your blood pressure medications ... always, sometimes, usually, never?

1   ALWAYS
2   SOMETIMES
3   USUALLY
4   NEVER
88 DON'T KNOW
99 NO ANSWER

For verification purposes and so that we can analyze this data by census tract, may I please have your name, address, and phone number.

NAME: _____

ADDRESS: _____

PHONE NUMBER: _____

That's all the questions I have and thank you for your participation!

Q70 INTERVIEWER RECORD GENDER OF RESPONDENT:

    1   MALE
    2   FEMALE

TIME END: _____

LENGTH: _____

DATE: _____

INTERVIEWER: _____

Vinegar (31)

Uses: Drink/Eat alone or mix with water
          Cook with it
          Put on forehead with cloth

Garlic (35)

Uses: Drink/Eat (clove) or mix with water
          Cook with it
          Take as tablet or capsule

Teas (4)

Uses: Drink/Eat alone or mix with water

Multiple Vitamins (2)

Uses: Take as tablet or capsule

Combinations of Above (3)
Combinations included: mixture of garlic and vinegar;
mixture of honey and vinegar; mixture of apple juice, grape
juice, and apple cider vinegar (commercially available
product).

Uses: Drink/Eat alone or mix with water

Other
Other included: aloe vera juice and lemon juice.

Uses: Drink/Eat alone or mix with water

Note: Numbers in parentheses indicate number of people who
used that home remedy. Some people used more than one home
remedy.

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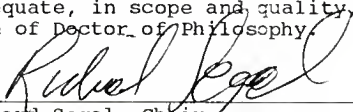
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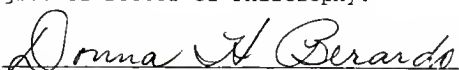
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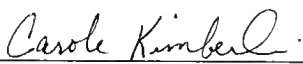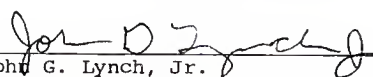
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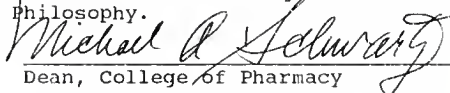a dissertation for the degree of Doctor of Philosophy.

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